The Boston Medical and Surgical Journal

Table of Contents

November 25, 1915

ADDRESS

WHAT THE GENERAL PRACTITIONER SHOULD KNOW ABOUT INCIPIENT PULMONARY TUBERCULOSIS. *By Vincent Y. Bowditch, M.D.,* Boston..... 795

MASSACHUSETTS MEDICAL SOCIETY

SYMPOSIUM ON EMPYEMA AND PULMONARY ABSCESS:

I. THE MEDICAL ASPECTS OF EMPYEMA AND PULMONARY ABSCESS. *By Frederick T. Lord, M.D.,* Boston..... 798

II. THE RECOGNITION OF PLEURAL DISORDERS BY X-RAYS, WITH SPECIAL REFERENCE TO EMPYEMA. *By Percy Brown, M.D.,* Boston..... 802

III. PNEUMODYNAMICS OF EMPYEMA. *By Frederic J. Cotton, M.D.,* Boston..... 804

IV. THE TREATMENT OF CHRONIC EMPYEMA. *By F. B. Lund, M.D.,* Boston..... 808

V. LUNG ABSCESS AND BRONCHIECTASIS FROM A SURGICAL POINT OF VIEW; CERTAIN END RESULTS OF ACUTE AND CHRONIC EMPYEMA. *By Wyman Whittemore, M.D.,* Boston..... 811

DISCUSSION..... 814

BOOK REVIEWS

Diseases of the Nose and Throat. By A. Coolidge, M.D..... 818

EDITORIALS

THE SYNDROME OF PERIODIC ASTHENIA..... 819

TRACHOMA AMONG NATIVE POPULATION..... 820

THE RÔLE OF INTERNAL SECRETION IN MENTAL CONDITIONS..... 821

IMPORTANCE OF EARLY USE OF DIPHTHERIA ANTITOXIN..... 822

TUBERCULOSIS DISPENSARIES..... 822

MEDICAL NOTES..... 822

OBITUARY

GEORGE MILLER STERNBERG, M.D..... 826

CORRESPONDENCE

MEDICAL EXPERIENCES OF A RHODES' SCHOLAR IN THE EUROPEAN WAR. *Wilburt C. Davison*..... 829

EXAMINATION OF THE NOSE IN EYE DISEASES. *Edward L. Parks, M.D.*..... 830

MISCELLANY

HEALTH OF THE UNITED STATES NAVY..... 827

MILITARY MEDICINE IN THE SEVENTEENTH CENTURY..... 827

SEIZURE OF SUBSTITUTE SPECIFICS..... 828

NOTICES, APPOINTMENTS, RECENT DEATHS, ETC..... 830

Address.

WHAT THE GENERAL PRACTITIONER SHOULD KNOW ABOUT INCIPIENT PULMONARY TUBERCULOSIS.*

BY VINCENT Y. BOWDITCH, M.D., BOSTON.

WHEN one recalls the almost endless amount of literature that has been given out on the subject for discussion today, he feels a natural hesitation in adding anything to what has already been said and written upon what would seem to be self-evident, viz.: the importance of early diagnosis in pulmonary tuberculosis.

Notwithstanding the great strides that the anti-tuberculosis work has taken in the past few years, it is still necessary to keep constantly before the public certain important factors that are essential to success in our efforts to control the disease.

That there has been comparatively lately a most gratifying change of attitude among a large number of the medical profession on this point must be evident to all those who have made for years a special study of the disease. The number of physicians who now seek a specialist's advice in obscure cases has greatly increased, but there is still much to be learned among the rank and file of the profession as to what really constitutes an incipient case; and there is even now a lamentable lack of care in paying attention to obscure but definite symptoms, which, if not promptly noted and measures taken to counteract them, will mean disaster to the patient.

The time has passed when, with symptoms of malaise, loss of flesh, and cough, no matter how slight, whether accompanied or not by feverish symptoms, the patient can be put off lightly with some hasty and often erroneous diagnosis. Too many patients, who, without proper examination, have been told they have a "stomach cough" or a "bronchitis," consult some one else, often the specialist, who finds definite evidence of tubercular disease. With our present knowledge, such superficial decisions are nothing short of culpable, and the harm done to the patient is often incalculable. It is, moreover, still a source of regret and surprise to many a specialist to note the number of patients who come to him with supposedly incipient disease which is really in a well-advanced stage, the extent of which has not been recognized by the attending physician until too late to accomplish anything other than a more or less temporary arrest of the disease, with little hope of permanent recovery.

I should be sorry if, by the foregoing remarks, I seem to disparage the frequently fine and noble work of the large army of general practitioners, especially those in country practice who have not the facilities for work that surround those who live in the city. My respect for the work and opinions of such medical men is of the very highest. All that I say is in criticism only of the methods of some (far too many) who do not pay sufficient attention to symptoms which may be indicative of beginning tuberculosis and therefore are really guilty of neglect of their patients.

* Read at the second annual New England Tuberculosis Conference under the auspices of the National Association for the Study and Prevention of Tuberculosis, at Westfield, Mass., Oct. 23, 1915.

It would, of course, be unjust in the highest degree to expect the general practitioner, no matter how conscientious and skilled in his profession, to be proficient in some of the finer methods of diagnosis which are possible to those who are making special studies of any one disease; and there can certainly be no loss of prestige or dignity to a physician if, in accepting this fact, he therefore calls to his aid expert advice in any doubtful case, and so gives his patient the best chance of regaining his health.

This brings us also to the undoubted fact of the lack of sufficient clinical instruction at present in most, if not all, our medical schools in methods of examination for tubercular disease in its pulmonary form. This is due, not to lack of ability in the teachers themselves, but to lack of time given to the subject and insufficient clinical instruction as to the various degrees or stages of this disease. I think it is not too sweeping an assertion to say that the ordinary medical student upon graduation can perhaps easily recognize a sonorous râle and the difference between absolute flatness in percussion and normal pulmonary resonance, but when launched upon the world, it is the exception when he is able to diagnose an incipient case of tuberculosis with its delicate shades of abnormal symptoms, although doubtless he can, with comparatively slight medical knowledge, usually recognize one that is in the later stages.

The argument that it takes a vast deal of time to become proficient on these points,—more than is possible in the ordinary curriculum of a medical school,—does not do away with the fact that most students are not sufficiently equipped in these matters, and that more can be done and should be done to remedy these deficiencies if we are to make proper progress in our anti-tuberculosis work. I regard it, therefore, as one of the essentials for success in the future that medical schools should be urged to greater activity in this direction.

What, then, constitutes an incipient case of pulmonary tuberculosis? It is not necessary here to launch upon a discussion as to whether or not all cases owe their origin to lesions formed in childhood and which remain dormant. Our chief concern now is to know how to detect at the earliest moment any possibly latent process which is bursting into sudden activity, no matter at what stage of life.

The National Association for the Study and Control of Tuberculosis, in conjunction with the American Sanatorium Association, published a short time ago a series of tables as a guide to classifying the various stages of the disease.* These tables have been prepared by committees of these associations after several years of frequent consultation with each other. I speak from long experience in knowing how difficult it is to get any set of classifications which shall be satisfactory to everybody. Necessarily all such classifications are more or less arbitrary, and are open to certain objections and limitations, but as a rule these serve as a basis for comparison and answer the purpose fairly well.

What symptoms are important to put physicians on their guard lest disease is beginning? In general, one may say, if a patient presents himself with a history of malaise for a number of weeks, loss of appetite and flesh; and if there has been ever so slight a cough or "clearing of the throat," with or without expectoration; and if upon trial a slight rise of temperature and an accelerated pulse are found; make a thorough examination of the chest at once, or as soon as possible after the visit if unable to give the proper time at first.

If, upon examination of the chest, a difference is found in the percussion note at the apices other than what normally exists consistent with health in a great number of people, viz.: a heightened pitch in the right apex; if there be any special departure from normal in the character of the respiration at either apex or locally elsewhere, combined with the symptoms above mentionel, *watch the patient* and keep him under supervision, with occasional examinations to detect any possible development.

If, moreover, a "click," a wheezing sound, or a râle of any nature, is found in one or the other apex of the lungs, watch carefully; and if the signs persist, you may be moderately certain without further assurance that trouble is brewing. Modern research has taught us that possibly these apical conditions may be consistent with disease other than tuberculosis (grippe, for instance), but in thirty years of practice, I have never failed to heed the excellent advice that was given me over and over again by my best teacher:

"If, with a history of abnormal symptoms lasting for a longer or shorter space of time, upon examination you find anything out of the normal at one or the other apex, watch your patient closely, for the chances are that there is or has been tubercular trouble there."

I am not referring now, of course, to the cases of apical pneumonia not uncommon in children but rare in adult life. There are always exceptions to every rule, but one cannot go very far wrong if, under such conditions as I have mentioned, special measures are taken to increase the patient's powers of resistance to the utmost and to keep him under supervision.

As aids to diagnosis, first, where possible, is the immediate examination of the sputum. *Do not delay.* There is no excuse for delay with our present state and municipal facilities for such examinations. If tubercle bacilli are found, of course we have the surest proof of the presence of tubercular disease, always remembering, however, that repeated *negative* examinations do not necessarily mean that no tuberculosis is present. In such cases, give the patient the

* Report of the Committee on Clinical Nomenclature. Transactions of the National Association for the Study and Prevention of Tuberculosis. Ninth Annual Meeting, 1913, p. 243.

benefit of the doubt, and do not relax in your observation of him.

As further aids to diagnosis, we have the oft-mentioned and frequently-used tests with tuberculin, either by the von Pirquet (skin) test, the ophthalmic test (now less frequently used), and the subcutaneous test, the most reliable of all. All are to be resorted to, however, only as corroborative of other positive symptoms; no one is to be relied upon solely, the von Pirquet test having proved to be of less value after adolescence than in the earliest years. In the subcutaneous test, the method which we have ordinarily made use of at the Sharon Sanatorium is, after making sure that the patient is free from heightened temperature for several days, to inject two milligrams of Koch's "old tuberculin," the patient being kept in bed and a four-hour chart taken to note any possible rise of temperature accompanied by symptoms of greater or less malaise during the ensuing 48 hours. Should two milligrams bring about no reaction, then five milligrams should be injected with the same procedure, a few days after the first dose; and finally a dose of ten milligrams, should the earlier trials be negative in result. One observer of high repute claims that if the smaller doses fail to give a reaction, it is not necessary to give the largest dose mentioned; but inasmuch as we have the authority of Koch himself, our usual custom seems justifiable, failure to react after the largest dose probably meaning that no tuberculosis is present.

The use of the x-ray has come to the fore in recent years and much is claimed for it as a valuable adjunct in the diagnosis of tuberculosis, whether doubtful or otherwise. By some,— I think I may say, a minority,—it is claimed that early doubtful cases can be more easily demonstrated as positive by the use of the x-ray than by auscultation and percussion. On this point, I must confess to considerable skepticism. One can easily conceive that an expert with the x-ray can see much that is not discerned by a less well-trained eye; but I find it thus far in my experience difficult not to believe that the examiner with a well-trained ear can more easily detect the slight abnormalities of *incipient* pulmonary disease, especially if the lesion be near the surface, than one who depends upon the presence of shadows made by the x-ray for his diagnosis. The comparative excursion of the two portions of the diaphragm as shown by the x-ray and demonstrated first by Dr. F. H. Williams, is a valuable adjunct in determining an abnormal condition of the lung.

In spite of the great advance that has been made in the practical use of the x-ray of late years, I can but feel that we have not yet sufficiently studied the causes of the phenomena shown by this method to warrant our drawing what have seemed to me at times hasty conclusions as to the amount and nature of disease which may be present in the lung. One thing is absolutely certain in my mind, viz.: that I have very little faith in the findings of any one but those who are experts in this department of science, and I most unhesitatingly condemn the diagnoses of tyros who, upon the insufficient ground of their own supposed findings in the use of the x-ray, give their patients unnecessary alarm and anxiety as to their bodily condition.

In conversation with experts I have been impressed and pleased by the conservatism which they have expressed on these points, for in that very attitude they show their own breadth of mental vision. Many times I have been told by them that, although they have been able to detect certain abnormal shadows over portions of the lung, they are quite unwilling often to make any positive diagnosis of the cause, although admitting the possibility that tubercular processes may be, or have been, present, while diseases of less serious nature, like grippe or bronchitis, may have been the causes of abnormal thickening of the lung tissue.

That future developments may bring us even greater proof of the efficacy of x-ray examinations in suspected lung disease, I am quite ready to believe, and I should regret it if I seem to disparage the work done by specialists in this department. I wish only to utter a word of caution against hasty conclusions made through lack of experience. As an illustration of this, allow me to cite one concrete example which came under my observation a few years ago. A young woman presented herself for examination because of great perturbation of mind from having been told after an x-ray examination of her chest by beginners in that branch of work, that she had "shadows in the upper portions of her lungs," and that she "showed signs of tuberculosis." This diagnosis was based solely on the x-ray examination. She had consulted a physician because of an annoying and persistent pain under the left scapula for a few months. This had been the cause of sleeplessness and much fatigue. She had had no symptom otherwise to make one suspect tuberculosis. She had been in perfect health in previous years; no trace of cough, expectoration, fever, loss of flesh, or other abnormal sign; but her mental condition consequent upon the grave diagnosis given her was distressing. A full examination of the chest by auscultation and percussion failed to reveal the slightest trace of pulmonary disease, and I felt convinced the pain was due to some pressure on an intercostal nerve, due partly to her occupation. I sent her to an orthopedist, who promptly made the same diagnosis, supplied a certain kind of corset, and in two weeks the absolute relief to the patient, both physical and mental, was something never to forget. The pain entirely disappeared and the patient has been perfectly well, and she wrote later of her excellent health and entire freedom from abnormal symptoms. A case of this sort should teach us much as to the unwisdom, to say the least, of hasty diagnoses.

Far more important, to my mind, than the results of tuberculin tests or x-ray examinations, is the patient's history, past and present, which usually throws a vivid light upon the whole question; his general condition, and his appearance, combined with the signs found upon the examination of the chest by auscultation, percussion, palpation, etc. If, added to those data, we have the aids to diagnosis just mentioned, we can with increased confidence advise as to what course should be taken by the patient to regain his health.

As a summary, therefore, of all that has just been said: The vital point in all examinations of patients is that we must not depend upon any one method alone unless the disease is so apparent that a mere tyro could make a diagnosis. That cases often appear which tax the skill and knowledge of the most expert observers, and in which it may at first be impossible for any one to make an absolute diagnosis, would seem to be a self-evident truth.

In thus speaking of the methods which should aid us in making the diagnosis of incipient pulmonary tuberculosis, I have touched only upon those which are most commonly used; and I have purposely refrained in this paper from alluding to some which are mentioned by various authors who lay stress upon certain methods which do not seem thus far to be of sufficient scientific or diagnostic value for ordinary use. They come more into the realm of the specialist, who has the opportunity usually for making more extensive observations than the general practitioner, and are interesting rather than of marked use in making a diagnosis. Among these, perhaps that mentioned by some writers as the "sign of D'Espine" is one of the most familiar, in which a certain bronchial character to the whispered voice in areas between the spine and the scapulae has seemed to indicate the presence of enlarged tubercular bronchial glands in children. It is extremely doubtful, however, I think I may say to most observers, whether this sign is absolutely to be relied upon as a means of definite diagnosis, although some writers believe that it has great value in this special form of disease, while granting that it may be not infrequently due to causes other than tuberculosis.

We have a long and difficult path ahead of us still in our endeavor to bring tuberculosis into the ranks of the diseases that can be kept under control; but with the great advance already made, there is hope ahead of us and no reason for discouragement, even if at times the goal seems far distant. It is only by constant reiteration of what would seem to be often self-evident truths, that we make headway. I trust that in placing before you certain opinions formed by my own experience, I may be adding something, however little, towards the desired result.

Massachusetts Medical Society.

COMBINED MEETING OF THE SECTIONS OF MEDICINE AND SURGERY.

SYMPOSIUM ON EMPYEMA AND PULMONARY ABSCESS.*

JUNE 9, 1915.

I. The Medical Aspects of Empyema and Pulmonary Abscess. By Frederick T. Lord, M.D., Boston.
II. The Recognition of Pleural Disorders by X-rays. with Special Reference to Empyema. By Percy Brown, M.D., Boston.
III. Pneumodynamics of Empyema. By Frederic J. Cotton, M.D., Boston.
IV. The Treatment of Chronic Empyema. By F. B. Lund, M.D., Boston.
V. Lung Abscess and Bronchiectasis from a Surgical Point of View; Certain End Results of Acute and Chronic Empyema. By Wyman Whittemore, M.D., Boston.

Discussion.

I.

THE MEDICAL ASPECTS OF EMPYEMA AND PULMONARY ABSCESS.*

BY FREDERICK T. LORD, M.D., BOSTON.

A CONSIDERATION of the medical aspects of empyema and pulmonary abscess has been assigned to me, and in the limited time at my disposal it seems best to speak briefly of empyema and more fully of abscess†. So far as empyema is concerned I shall attempt to consider only certain aspects of the treatment.

EMPYEMA.

Whether the treatment of pleurisy with effusion should be medical or surgical depends for the most part on the character of the fluid, concerning which it is desirable to know the gross appearance, whether clear, cloudy, or opaque, the specific gravity, the amount of albumen contained, the character of the cells obtained after sedimentation, the results of cultural tests for bacteria, and in certain instances the results of animal inoculation. Excluding from discussion other than the inflammatory fluids, an important matter to decide is whether the treatment is to be by thoracentesis or by operation.

It is generally agreed that clear serofibrinous effusions should be evacuated when there are pressure symptoms or when the fluid is of large amount, and that effusion of medium amount should be removed when, after the ineffectual trial of other methods, two or three weeks have elapsed. In such cases thoracentesis is the procedure of choice.

* Presented before The Massachusetts Medical Society, June 9, 1915.

† Empyema and pulmonary abscess have been discussed by me elsewhere as follows: The "Diagnosis and Treatment of Abscess and Gangrene of the Lungs, with Special Reference to Operation." *Internat. Clinics*, Vol. ii, 16th S., 1906. "Diseases of the Pleura," *Osler's Mod. Med.*, 1907, Vol. iii. "Disease of the Bronchi, Lungs and Pleura." Lea and Febiger, Philadelphia, 1915.

The judgment is more difficult in those cases in which there is a turbid effusion or one on the border line between serofibrinous and purulent fluid. It is desirable to know the cause of the turbidity, which may be due to the presence of albumen in fine subdivision, fibrin in the form of flocculi, clot, fat or cellular elements. While the presence of blood or a large amount of pus may be sufficiently obvious on gross inspection, more careful study of the fluid is the part of wisdom if mistakes are to be avoided. The character of the cellular elements and the results of cultures are of most importance in deciding whether thoracentesis alone, or operation, is necessary. With turbid fluids, which contain merely an excess of polynuclear leucocytes, evacuation by thoracentesis may be sufficient to effect a cure, as in 15 of 27 cases at the Massachusetts General Hospital. In the remaining 12 cases pus was demonstrated at later tapping and thoracotomy was performed. Turbid fluids containing merely an excess of polynuclear leucocytes secondary to lobar pneumonia or due to the pneumococcus are relatively favorable for thoracentesis. Pneumococci may be demonstrable in stained smears from such material, but may be incapable of cultivation. Even with positive cultures for pneumococci, frank empyema does not necesarily follow, and thoracentesis alone may be tried. With turbid fluids containing abundant or necrotic leucocytes and positive cultures for pneumococci, operation is usually necessary. Streptococcus infections rapidly tend to become purulent and generally demand operation. In the decision between thoracentesis alone and open incision, such other factors as the degree of sepsis, the amount of fluid and the rapidity of reaccumulation must also be considered.

With frankly purulent effusions, on the other hand, except as noted below, an immediate and free drainage of the pleural cavity is essential for prompt and permanent cure.

It is important to remember that an open incision is not the procedure of choice in all empyemata. In those cases in which the pus is sterile on cultivation or contains tubercle bacilli alone it is best to evacuate the fluid by thoracentesis. Open incision is likely to be followed by a persistent sinus. Tuberculous empyema complicated by infection with pyogenic cocci is usually best treated by open incision, when the effusion occurs early in the course of pulmonary tuberculosis, but in the advanced stages of the disease a radical operation can hardly be considered, and repeated puncture may be tried.

In the presence of large collections of pus in the pleural cavity in patients who are gravely ill, evacuation by thoracentesis may well be undertaken as a preliminary to operation or as a life-saving measure. In such patients the sudden change in the mechanical conditions after open incision is often followed by a rapidly fatal termination.

PULMONARY ABSCESS.

In considering this subject I shall not attempt to distinguish between abscess and gangrene, and propose to discuss the two processes together. Grouping together the cases I have collected from the records of the Massachusetts General Hospital and those seen in consultation, there are in all 185 cases.

Certain features in the etiology are worthy of note. In 85 cases the cause is not wholly clear, but from their insidious onset or occurrence following an acute infection of the upper parts of the respiratory tract an origin from broncho-pneumonia may be suspected. Abscess is not an infrequent finding at autopsy in cases of broncho-pneumonia. Of 85 cases of broncho-pneumonia coming to autopsy at the Massachusetts General Hospital abscesses were found either macro- or microscopically in 16, a proportion sufficiently high to suggest that, had these patients survived, the losses of pulmonary substance would probably have proceeded to full recovery in many instances.

The next most important cause is lobar pneumonia, which is represented by 30 cases. In lobar- as in broncho-pneumonia, the development of abscess is an infrequent clinical finding, but more common at autopsy. Thus of 51 cases of lobar pneumonia coming to autopsy abscesses were found either macro- or microscopically in 14, suggesting that the clinical infrequency of abscess in lobar pneumonia is more apparent than real, and that certain cases of pneumonia are complicated by small losses of pulmonary substance which proceed to full recovery.

Another important cause, represented by 25 cases, is the aspiration of infected material into the deeper parts of the respiratory tract. In this group are included such abscesses as arise after etherization for operation upon parts of the body remote from the respiratory tract (10 cases), the extraction of teeth (5 cases), the removal of tonsils (2 cases), and adenoids (1 case), the inhalation of foreign bodies (4 cases), and submersion (3 cases). The unfortunate occurrence of pulmonary abcess in this group is not always avoidable, but its incidence will diminish with greater caution in selecting the time for operation under ether, and the postponement when possible of operative interference, until the respiratory tract is clear of infection, greater care in the prevention of inhalation of blood or other material during operations about the mouth and the naso-pharynx and the early removal, with the aid of bronchoscopy, of inhaled foreign bodies.

Regarding the pathology of abscess, there are certain aspects of the process with a bearing on surgical intervention and consequently a special interest on this occasion. Pulmonary destructive lesions are more often multiple than single. They are usually situated toward the periphery of the lung near the pleura and not deep within

the substance of the lung. This prevailing subpleural site is worthy of the attention of the surgeon, who would do well carefully to explore the more superficial parts of his field of operation in difficult cases before proceeding to deepen his incision. All destructive pulmonary lesions are complicated after a time by the development of indurative pneumonia, which is more dense and more extensive the longer the disease has lasted. Induration of the tissue about the abscess diminishes the likelihood of successful operative interference. The pleural layers overlying the destructive pulmonary process are adherent or separated by purulent fluids in about one-half the cases. It must be appreciated that time is an important element in modifying the pathology of abscess, and that the longer the process has lasted the more likely are the lesions to be multiple and surrounded by indurated tissue.

The clinical manifestations are, in general, those of sepsis, with fever, elevated pulse, sweats, chills and leucocytosis, and with special reference to the lung, cough and the expectoration of purulent and oftentimes foul material. If the case is seen at a time when the abscess has not yet ruptured,—an uncommon occurrence,—there may be the clinical features of sepsis with trivial local symptoms. Sputum is usually present from the beginning and expectorated in smaller or larger amounts at frequent intervals, less commonly in large amounts at infrequent intervals. Hemoptysis is a feature in a small proportion of the cases.

The pulmonary signs are very varied. There may be only the persistence of râles at one place in the lung or typical signs of consolidation, *i.e.* dullness, bronchial breathing, increase of voice, whisper and tactile fremitus. The signs of cavity,—tympany on percussion, amphoric breathing, metallic râles, etc.—are demonstrable only in a small proportion of the cases, and their absence should not be regarded as evidence against the presence of pulmonary abscess.

There are three indications which I have come to regard as a most important triad of signs. The sign which is common to the largest number of cases is dullness on percussion, which may or may not be accompanied by other physical findings. It may be very marked or elicited only by careful comparison of the percussion note on the two sides of the chest. The second indication is the evidence of a circumscribed increase of density of the lung on x-ray examination, and this is almost indispensible when surgery is under consideration, since it is of material assistance in the exact localization of the process and the exclusion of numerous small multiple foci which might make operation inadvisable. The third important factor in deciding upon the presence of a destructive lesion is the demonstration of elastic tissue with an alveolar arrangement in the expectoration. If elastic tissue cannot be found there is the possibility of mistaking the disintegration of pus in a dilated bronchus for a pulmonary abscess. It is highly desirable in making the diagnosis of abscess to have these three signs positive, but it is by no means necessary that they should all be present, and of the three I have failed most often to demonstrate elastic tissue.

It is of paramount importance before making the diagnosis of a non-tuberculous destructive process thoroughly to exclude tuberculosis, and the sputum should be carefully and repeatedly sought for tubercle bacilli. It is manifestly easier to exclude tuberculosis in these lesions than in cases suspected of incipient tuberculosis, because a pulmonary process which has progressed to the stage of tissue destruction without showing tubercle bacilli in the sputum is not likely to be tuberculous. The presence of elastic tissue and the absence of tubercle bacilli in the same specimens is a double assurance against the tuberculous nature of the destructive process.

One caution I should like to emphasize in attempting to make the diagnosis of these destructive pulmonary lesions, and that is in regard to the use of exploratory puncture. Exploratory puncture is frequently performed in such cases, but it would be better if it were never done. There are dangers which the records of any large hospital will probably show, and certain of our records do show in the performance of this apparently simple operation. The pathology of abscess or gangrene is such that blood vessels lining the wall or traversing the lumen of the cavity may be unsupported by any tissue, and their injury may be followed by severe and even fatal hemorrhage. A second feature in connection with the more chronic cases is the displacement of the diaphragm upward in consequence of the loss of pulmonary substance and the contraction of connective tissue. In some cases the upper level of the diaphragm is elevated far beyond its normal position into the thoracic space, and its perforation by an infected instrument may lead to fatal peritonitis. This last danger is not confined to chronic abscess or gangrene, but is common to all chronic inflammatory lesions in which replacement of normal structures by connective tissue takes place. It is a matter which should be constantly in mind, not only in connection with chronic pneumonitis, but also with chronic empyema, and in any such condition when thoracentesis is under consideration it is desirable that the exact position of the diaphragm be determined by x-ray examination before an exploratory puncture is made.

In regard to the prognosis of pulmonary abscess and gangrene, the mortality of gangrene may be estimated at about 80% in unoperated cases. The mortality of abscess is probably a little lower than that of gangrene. In 31 of the more recent cases of unoperated abscess in my series the condition at and after discharge from observation has been determined and 22 died, a mortality of 70%. It should be said concerning the outlook without operation in the remaining 20 to 30% that while in many instances there is

relief of the more urgent symptoms, yet there is only uncommonly a complete recovery from the suppurative process. The patient is likely to be continually harassed by the expectoration of purulent material and constantly liable to recurrent attacks of broncho-pneumonia and gradual extension of the pulmonary infection. Complete recovery from these destructive pulmonary lesions without operation occasionally occurs, however, and I have had the good fortune to see this take place in three private and two hospital cases. In all five of the cases there were symptoms of sepsis and cough with abundant foul sputum. The onset was insidious in three, in one the pulmonary symptoms followed the extraction of teeth under ether and in the last case an infected embolus from the hand was the probable cause. The duration may be estimated to have been from about two to ten months. Dullness on percussion, with or without other signs, over a circumscribed area was present in four, while physical examination was negative in one case. X-ray examination was not made in one, but was positive in the remaining four cases, two of which showed suggestive evidence of a pulmonary cavity. Elastic tissue was not demonstrable in one, but was found in the sputum of three cases, and in the remaining case a lung shred was discovered. In three of the five cases I was able to obtain an examination by means of the x-ray after the process had fully subsided, and in none of these could x-ray evidence of any residual disturbance in the lung be demonstrated. In all cases the recovery was complete and the patients are still without cough or expectoration.

One of these recovered cases deserves mention in somewhat greater detail. It was the case of a man of 41 who came to me Dec. 4, 1914, with the history of cough and purulent expectoration for the preceding seven years. He gave the history of having had foul expectoration only since October 15, and this feature of the story is worthy of note and is a matter it is well to have constantly in mind in taking the history in such cases. While the patient may have had a long continued pulmonary infection, it may be possible to elicit from his story an indication of a more recent origin of a complicating destructive process, thus putting a more favorable aspect on an otherwise serious situation. This patient expectorated about a glass full of very foul sputum in twenty-four hours, and during paroxysms of cough his breath was very offensive. There was dullness in the right mid-back, positive x-ray with evidence of a cavity partly filled with fluid which changed its level on changing the position of the patient, and in the sputum no elastic tissue but a lung shred. He had fever and leucocytosis and was constantly losing weight. In view of the progress of the disturbance I suggested, and even rather urged, operative interference. He took the matter under consideration and did not at once accept my advice. He soon began to improve, and in about two months from the onset was completely well and without cough or expectoration, a surprising result, especially in view of the pulmonary symptoms preceding the more recent origin of the abscess. X-ray examination by Dr. W. J. Dodd, on March 11, 1915, three and one-half months after the first observation, showed no evidence of the previous trouble.

Such an experience as this is, of course, exceptional, but the chances of spontaneous resolution of pulmonary abscess, slight though they be, must be taken into consideration, and make it desirable, if possible, to keep these cases under observation for a time to determine the tendency of the process for better or worse. It may in general be said that to a limited degree the cause has a bearing on the outlook, lobar pneumonia or trauma being relatively favorable, the inhalation of foreign bodies or the lodgment of infected emboli in the lung being less hopeful for recovery.

Regarding treatment, it is important to remember that while surgery offers the greatest hope it is not to be applied indiscriminately to every case and that other and simpler measures may be expected to be of distinct advantage. All patients with symptoms of sepsis should, of course, be abed. An abundance of nourishing food and fresh air are of importance. The toxemia and general sense of ill-being may be lessened by cautioning the patient not to swallow his sputum. The effect of posture should invariably be given a thorough trial. Evacuation may be favored if the patient lowers his head over the edge of the bed during a paroxysm of cough. At stated intervals and for a certain period the patient should lie with the affected side uppermost with the purpose of draining the pus into the trachea. Elevation of the foot of the bed for a time night and morning, the patient meanwhile lying at full length on the back or abdomen and without a pillow, should be tried.

In deciding between expectant treatment and surgery, the clinical aspect is of prime importance. The general appearance of the patient and the degree of sepsis, measured by the temperature curve, the pulse rate, sweats, chills, and the white count, are valuable guides. A daily record of the cough and the amount of expectoration are important for the estimation of progress. Persistent septic features, with an increasing amount of sputum and abundant elastic tissue or lung shreds indicate an advancing lesion. The chances of surgical relief diminish with the lapse of time. Of 31 operated cases, in 19 with a previous duration of nine months or under, 5 died and 1 was not relieved, the result thus being unsuccessful in about one-third of the cases; while of the remaining cases, 7 were relieved and 6 cured, a favorable outcome in about two-thirds of the cases. Of 12 cases with a previous duration of nine months to two years, 5 died and 2 were not relieved, the attempt at relief thus failing in about three-fifths (58%)

of the cases, while the remaining 5 cases obtained notable relief, but as yet no permanent cure. A more extensive lesion, multiplicity of foci and the presence of dense induration about the affected regions probably account for the less favorable result in the more chronic cases.

The indications for or against operation are difficult to formulate and each case must be decided on its merits, but as a general rule it may be stated concerning the acute cases that in the presence of a small process, without marked symptoms of sepsis, with purulent and not foul expectoration and without a large amount of elastic tissue or lung shreds, an expectant policy may be followed. If, after observation for three to four weeks, recovery or marked improvement does not occur, operation should be considered. Operation is indicated, on the other hand, with an extensive process, marked sepsis, putrid sputum, and abundant elastic tissue or lung shreds. The exigencies of the individual case determine the propriety of operative interference in cases which have lasted for months or years. The condition may be intolerable to the patient or so menacing to life as to justify surgical intervention, even though little more than partial relief may be expected. Circumscribed, inextensive and single lesions offer a greater hope of success.

The advantage of surgery over the expectant treatment of abscess or gangrene cannot be estimated alone by the mortality returns, which though sufficient to prove that surgery is the more effective, do not tell the whole story. The observation of cases before and after operation, even when the outcome is unfavorable, oftentimes indicates that the operative procedure was justified, as indicated by diminution in the degree of sepsis and the amount of foul sputum, and if performed earlier or under more favorable local conditions might well have been successful in affecting a cure.

II.

THE RECOGNITION OF PLEURAL DISORDERS BY X-RAYS, WITH SPECIAL REFERENCE TO EMPYEMA.*

BY PERCY BROWN, M.D., BOSTON.

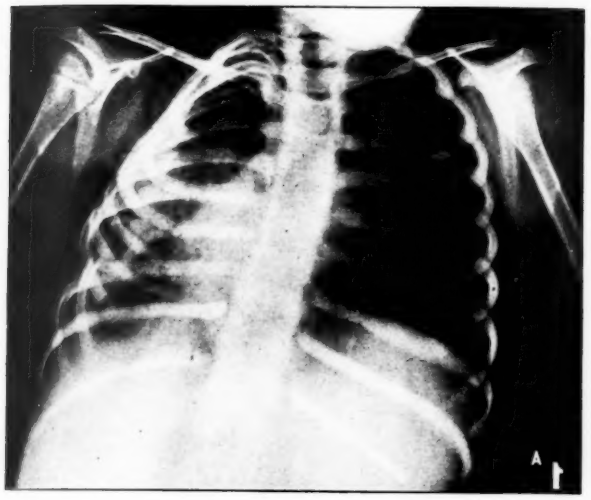
IT occurs to the writer that, perhaps, the chief value of any contribution to a symposium lies in its brevity. Circumstances make it possible for him to attempt to demonstrate his assertion, for it so happens that, concerning the matter of pyogenic infections of the pleurae, to which he purposes to confine himself, the diagnostic help afforded by x-rays plays a part secondary to the usual forms of clinical investigation. Only occasionally is the condition difficult of clinical diagnosis, and its chronic existence may be often inferred from mere inspection, amplified by the art of deduction. On the other hand, x-rays used as a means of recording the extent of the process, the neighborhood disorders which it engenders and the progressive effect of appropriate treatment, offer a field of which the fertility is not always taken advantage of.

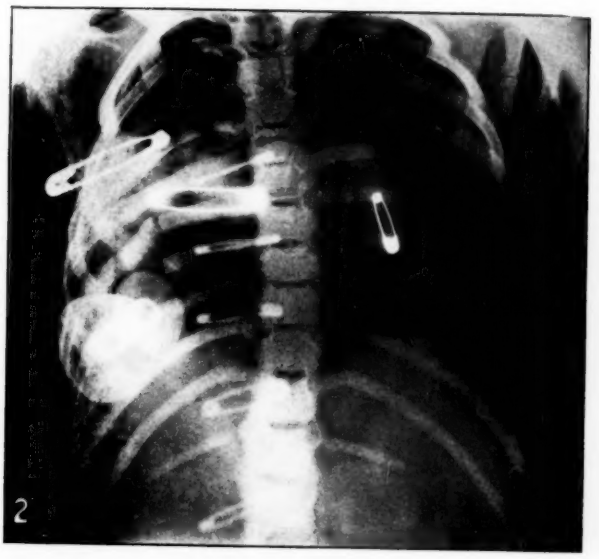
There are surely reasons for this, and some of them, possibly, merit a moment's discussion. The chief of them all, it seems, is the difficulty of bringing the patient and a proper source of x-rays into immediate corelationship, except in favorable instances where the patient may be in a hospital. This applies less to the acute, dry or plastic pleuritides, since it is hard to see where roentgenological examination here can add to the information to be obtained by auscultation and percussion. In acute cases, however, it will be found, as shown by experience, that the time spent with the fluorosopic screen is not wholly wasted. The effusive stage which, as it increases the amount of its inflammatory product, bringing with it the respiratory distress and increasing subjective weakness, seems to widen the chasm of difficulties attendant upon the ambulation of the patient. The precursors of purulent pleurisy, such as a pneumonia or a focus of profound sepsis, may, likewise, have reduced the patient to a condition which contraindicates strongly any gross disturbance of him, such as removal from the sick room or ward.

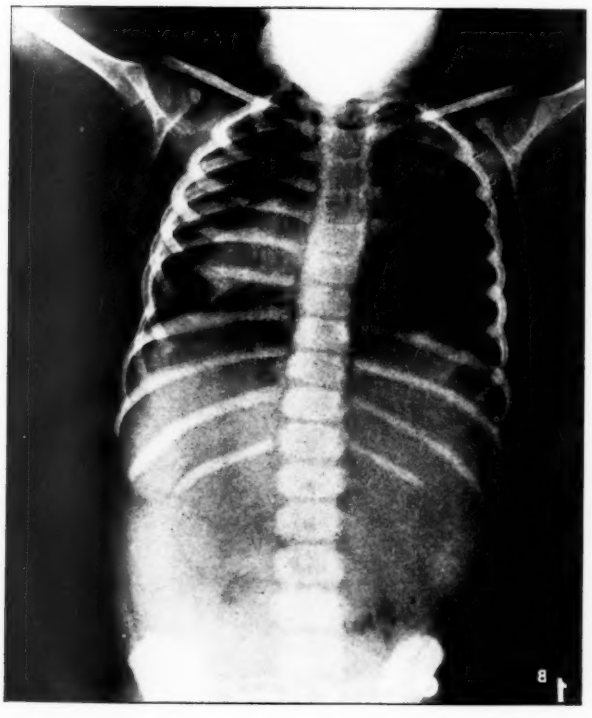
It is a happy fact that, in the acute or subacute pleural disorders, the employment of fluoroscopy, or visual examination with the screen, far exceeds in value the production of graphic records upon plates or films—so-called radiography. If x-rays are to be used at all in the dynamic stages (and, be it said, they can in such cases be used only in a way accessory to the incontrovertible methods of physical examination we all know), it is largely the limitations to normal respiratory function we wish to observe. Even if effusion has appeared and is beginning to occupy the domain of the retreating friction-rub, we can largely deduce its composition by observing its readiness to comply with hydrostatic laws. These observations are to be made by fluoroscopy alone.

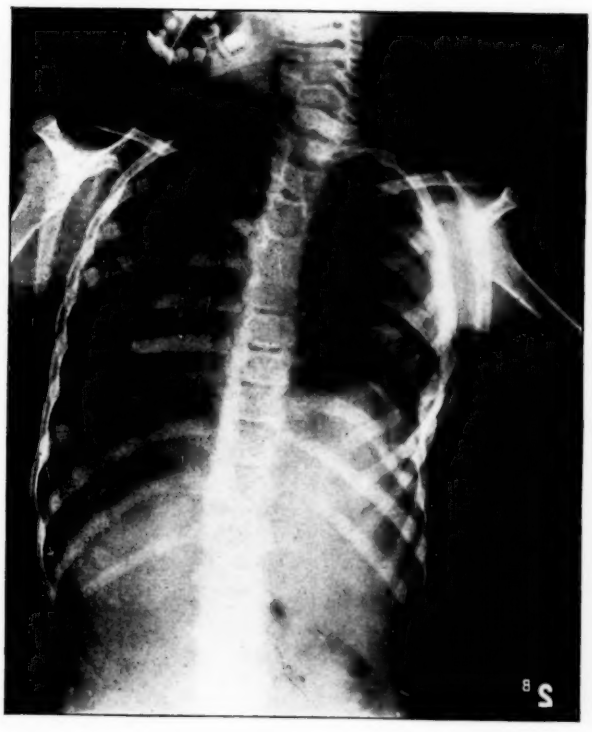
Since, therefore, fluoroscopy is to be desired at times in non-ambulatory cases, while radiography as often goes a-begging, one must surmount the difficulty of producing a transportable fluoroscopic apparatus. As a matter of fact such a task is relatively easy—much more so than transportable radiography is. In the acute cases, as has been said, the phenomena of physiologic motion, or of pathologic departure from it, are primarily to be observed. In instances where the by-products of inflammation are accumulated, but where the case is as yet to be maintained in comparative quietude, the effect of posture upon the level of the effusion may be noted roentgenographically, and coöperation, at least, afforded to the hand guiding the aspirating

* Presented before The Massachusetts Medical Society, June 9, 1915.

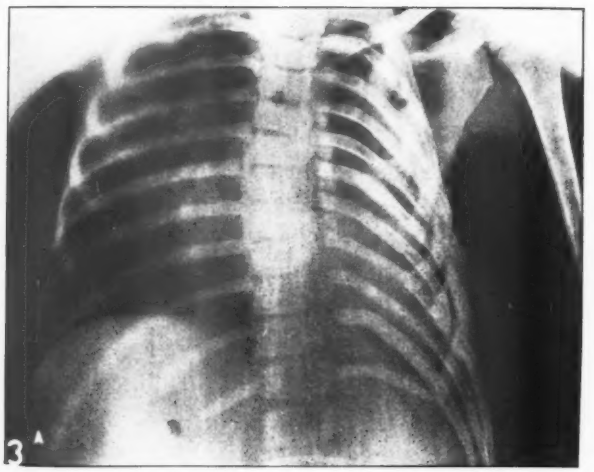

1A


2


1B


2B

3C


3A

3B

needle. Here also the roentgenologist may even venture to afford material help to auscultation and percussion, with due respect, especially if pyogenesis has set in and the effusion becomes sacculated or interlobar.

Besides, fluoroscopy, in the cases of those who are acutely sick, disturbs the patient no more than a thorough investigation by auscultation and percussion often may. The extreme necessities of the present war have become mothers to inspirations of invention resulting in marvels of mechanical convenience by which x-rays may be used in the field and at the bedside, and a thoroughly transportable fluoroscopic apparatus for use in more peaceful surroundings is soon to be, it gives one pleasure to say, an accomplished fact.

Roentgenography comes into its own, so to speak, when the subacute or chronic cases are to be considered, or when the variant dispositions of effusion are to be observed. The chronic adhesional pleuritides, which may include the empyemata, may be classed in this gamut. To the writer's mind the deformities of the pleura are to be considered of equal importance to those of the upper respiratory passages, to those of the digestive apparatus, and to those of the articular structures. The respiratory ravages produced by the empyemata of childhood may complicate, in a way purely mechanical, the future existence of the individual. The parietal contractures and the malposition of the ribs make a determination of the amount of usable lung a matter of great difficulty by auscultation and percussion, even to the most sensitive ears. The proportion of serviceable vesicular tissue beneath non-expanding chest walls is by no means difficult to determine by x-rays, nor are the limitations of such tissue in inspiration and expiration. The same handicaps are thrown in the path of auscultation and percussion when it becomes necessary to determine the displacement of neighborhood viscera within a deformed chest or beneath organized exudate. This applies especially to the heart. By x-rays, rarely is the cardiac-shadow lost behind that of an effusion, while it will be visible through the most dense exudative organization.

To him who may be more interested in therapeutics and its results, much information is afforded by x-rays with respect to the phenomena of resolution, absorption, expansion, and the general or partial resumption of normal state or function. Especially gratifying to see are the evidences of the mastery of Nature over the apparently crippling consequences of a purulent pleuritis.

In order that such may be seen by this company and that it may be spared a humdrum demonstration of pleural effusions of all sorts and types, familiar to every eye and ear, it is the writer's purpose to present to you the end-results as demonstrated by x-rays in three cases which differ somewhat in etiology and in nature.

The first is that of B. A., a child between four and five years old, who first came under observation during the middle of last December. She presents no history of the exanthemata or of other infectious process. She does, however, give a history of persistent nasal catarrh and a multiplicity of head colds. On physical examination, her tonsils are slightly enlarged, but seem not to be the hosts of acute infection. She has a few small cervical glands. Her lungs present a slight dulness in the left back from the mid-scapular line to the base; in the axillary line from the fourth rib to the base. Over a small area as large as a silver dollar, breath sounds are diminished and expiration is slightly prolonged and high pitched. No rales are heard and no dullness is perceived. The sign of D'Espine is not present. A provisional diagnosis is made of lobar pneumonia. A few days later the dulness extends over the entire left lung and dulness to flatness from the mid-scapula to the base. Bronchial breathing appears about the base. On the twenty-sixth day of the month, the lower left chest is flat. The respiratory murmur is lost — the bronchial breathing is distant. The heart is percussed as four centimeters to the right. The diagnosis is pleuritis with effusion. On the same day the patient is aspirated and one ounce of pus obtained. The child is then referred to surgical care. The following day the rib is resected by the classic operation. A large quantity of yellow pus with cheesey flakes is obtained. In this specimen there is reported the existence of the pneumococcus. Drainage is instituted. Two months later the subsequent history describes a period of somewhat sluggish drainage and a subsequent operation for producing it more freely. The second record shown you is that of this child six months later, after complete closure of the wound and after a course of therapy directed toward exercising the lung by means of Wolff bottles, horns and the like. The change, you see, is marked and distinctly for the better, but presents otherwise no especial interest. In short, the case is one which is typical as showing the value of subsequent examinations and ultimate permanent records. Such comparative records, at once all-embracing and graphic, can be obtained only by roentgenography.

The second case is that of F. T., a girl of eight, first seen in September of last year. She gives a history of previous empyema which has been draining for a long time and, of late, she complains of more cough and of cold sweats. She presents a considerable degree of thick, yellow expectoration. On examination, her tonsils are slightly enlarged and her lungs present a diminished expansion, with especial reference to the entire right base. A gross degree of flatness obtains over the area of the drainage tube. Vocal fremitus is absent as well as breath sounds. The operation, naturally, consisted of a reëstablishment of drainage. A month later the operation of decortication was done and the visceral pleura was found to be holding the lung tightly back. This was incised and freed. The etiological factor was found to be the staphylococcus albus. The length of duration in this case has, apparently, produced much thoracic deformity which, by x-rays, is more apparent anteriorly than behind. The first record shows the causation of the dulness to flatness about the original drainage tube. The case has recently been seen by the writer with reference to the end-result. As one may easily see in the next record, nature has

made the best of a hard task. Especially posteriorly is the degree of resolution and repair most apparent.

The third case is that of W. J., age six and one-half years, who was seen in November presenting the following history: a pneumonia was sustained at the age of four, followed by empyema. Three months later a rib resection was done. Five months later, a second operation. Even after the second operation an undiminished discharge persisted. General health became poor and appetite meagre and the bodily weight diminished. At the time of hospital entrance vocal fremitus is absent over the lower two-thirds of the left side; flatness on percussion. Voice and breath sounds are absent. The right lung gives good resonance. The finger tips show most beautifully the chronic osteoarthropathies of pulmonary origin. The operation consisted in a new resection. The old sinus was made freer. A few days later the boy is observed not to be doing well. The discharge is small. The left upper lobe presents bronchial breathing and dullness on percussion. Three days later the crisis of an apparent secondary pneumonia occurred and the sinus discharge markedly improved in amount. The next month the boy continued slowly to get better. The amount of discharge is diminishing slowly. Blowing exercises have been instituted.

This boy was handicapped not only by low physical resistance, but by the onset of a secondary pneumonia, yet the degree of expansion which has taken place in his case is remarkable, especially when comparison is made between the records now to be shown. The first record was obtained in November of 1914 and the last but a few days ago.

Thus it will be seen that the function of x-rays by no means ceases when the initial diagnosis is made or when secondary diagnoses are made. They are most properly an agent by which may be observed and recorded the degree of handicap with which the patient has forthwith to contend. As such, their function is far more important than as a desirable but unnecessary and secondary adjunct to a diagnostic procedure as old as the day of Laennec.

To him who prizes the graphic evidence of pathologic processes, as well as to him who cherishes the gratifying evidence of his own good work, a dependable record by x-rays is not only a thing of beauty, but becomes a joy forever.

III.

PNEUMODYNAMICS OF EMPYEMA.*

BY FREDERIC J. COTTON, M.D., BOSTON.

THERE is a whole physiological literature centering around the essentially simple condition of a rigid thoracic cage, varying in content with a moving diaphragm, containing an elastic, collapsible body—the lung—held from collapse, primarily, by the air-tight empty pleural cavity.

* Presented before The Massachusetts Medical Society, June 9, 1915.

Surgically, the points of interest are less in number, though even the surgical literature is rather vast. What we wish to know for practical surgery may be summed up as follows: —

1. What happens in pleural effusion?
2. What happens in pyopneumothorax, simple or valvular?
3. What happens if we tap one or the other?
4. What happens if we open the chest?
(a) With a small opening.
(b) Wide open.
(c) Right and left.
5. What factors govern the varying collapse of lung?
6. The clinical features of lung collapse.
7. The effect of intratracheal insufflation.
8. The effect of the now nearly obsolete positive and negative pressure chambers that have cost so much work and thought.
9. The question of drainage.
10. Reëxpansion of compressed lung.
(a) Immediate, as in empyema operations.
(b) Later, by valves or siphon or suction.
(c) Expansion by cough, Wolff bottles, etc.
11. Physics of chronic empyema.
12. Physics of Schede or Oestlander operations.
13. Physics of decortication.
14. Physics of heavy negative pressure with or without decortication.

In the normal chest there is rhythmic, alternating, increase and decrease of cubic contents, as diaphragm and chest muscles act. If air goes in and out freely, neither positive nor negative pressure reach any high grade; with closed glottis, the pressure variation is far greater, of course.

In the pleural cavity tension varies from about 4.5 mm. Hg. to 7.5 mm. (Heynsius); according to Aaron (who did his experiments on man) this pressure varies from 3.02 mm. at the end of expiration, to 4.64 mm. at the end of inspiration; this under quiet conditions. Forced respiration is said to give readings as low as 30 mm. Hg.

Not less than five factors come into play in determining the intra-pleural pressure: the positive pressure of expiration; the negative pressure of inspiration; the elasticity of the lung (a factor in negative pressure, as far as it goes, measured to about 3 to 7 mm. of mercury); lymphatic absorption, that clears the cavity of fluid, but is actually a result of the pressure factors rather than an active agent in determining pressure, so far as we know; and last, but by no means unimportant, the "surface tension" of the great pleural surfaces, tending to preserve their contact.

A mere leak in the parietal pleura does not produce collapse. We are told that this depends on the size of the parietal leak: that such a leak may not exceed in cross section the size of the lateral primary bronchus, without lung collapse. This may be so in times of quiet respiration, but all of us have seen, at operation, holes far larger than any bronchus, filled with lung tissue, sug

gesting the beginning of that "hernia of the lung," which I know only from the older literature. This is not a question of surface-tension alone, of course. The useful fact to know is that surface tension alone tends to prevent lung-collapse, if the pleura is *slightly* torn. Given a larger wound, the lung tends to retract sharply, unless held by adhesions.

It does not collapse entirely in human cases, as it does in some animals, simply because the human thorax is very broad and shallow, with a short and strong mediastinum between the halves; a very different condition from the *long, lax* curtain in the deep *narrow* chest of most lower orders.

In man, one side of the chest may be full of fluid or of air, with very little effect on the other side. The heart goes over a bit, but the cavity remains, with relatively rigid walls. Inspiration sucks in air, but more than this, expiration pushes air, not only into the trachea, but into the other bronchus as well, and if the glottis closes during expiration, two or three times, as with a cough, the other lung fills full!

Commonly with the deep, irregular coughing respiration that these cases show under light anesthesia, the air forced from one lung to the other, under quick expiration, with partial glottis-closure, suffices to fill a collapsed lung *entirely;* sometimes to keep it filled—once a dressing is on—for an indefinite time.

Now to go back to our questions.

What happens in case of pleural effusion? Fluid collects and until a considerable mass collects, the tension question is practically unaffected; the lung on this side grows less in volume, largely through collapse of the lower lobe. Lung elasticity and consequent retraction keep the tension balance nearly even. The upper level of the fluid (as Garland of Boston showed in the first paper I know of on Pneumodynamics) is not a level, but a curved line. The x-ray shows a similar irregularity in the upper level; there is, in fact, as the x-ray shows, *not a definite level at all,* but a gradual diminution in wedge-shaped cross section, between lung and chest wall, with a sort of flat "S" shaped profile. As the fluid, serous or purulent, increases in amount, the diaphragm *sinks* under the weight, and presently the intrathoracic pressure on this side becomes continuously positive. Heart and other mediastinal structures are pushed over well beyond the midline. This is the stage of dyspnea and eventually of cyanosis. One lung is enough to breathe with, if the patient is quiet, but this one lung must be undisturbed, and one lung under pressure is not enough for comfortable function.

In "pneumo," which is always "pyo" pneumothorax, the fluid weight is less; the diaphragm is less pushed down; cross pressure on the other side is less, as a rule. Physical examination reveals the condition pretty clearly,—a horizontal level between denser fluid below and air-filled pleural cavity.

X-rays show fluid below with air above, but in this case the line is not Garland's line, but a *level* between water and air,—*horizontal,* varying, of course, with the posture of the patient.

In all cases of pyo-pneumothorax, the pressure must, I think, be positive, but this pressure is ordinarily slight. Given a wide-open pneumothorax opening into the lung, the pressure must be zero, but this is not the condition that occurs in fact. The opening is commonly small (at least at first), and air is pumped into the pleura more easily than it gets out.

In one case of my own, a policeman, shot full of birdshot by a "yegg," and *in extremis* from pneumo-hemo-thorax, with obvious pressure, a simple tapping of the over-filled pleura brought his heart back to mid-line, saved the situation, and (as the valve action had ceased) led to his prompt recovery.

In another case I saw with Dr. Bapst Blake, a free opening of the chest saved, at least for a time, a tuberculous patient, in whom a valve-like lung perforation had led to a distention, constantly increasing, that threatened life.

What happens if we tap a chest?

Years ago I punctured a chest full of fluid with the knife point, intending to go ahead in the usual way. Before more than 1 to 2 c.c. of fluid had escaped, respiration stopped, and despite all restorative measures, was not reestablished in this case. It was a case of extreme positive pressure with cyanosis from total empyema; a rather desperate case from the start.

What happens in such cases of vasomotor death, no one knows, of course, but I suspect there is a factor of safety in securing the relief of *extreme positive pressure* with a needle, *without anesthesia.* The case noted was lightly anesthetized, and even light anesthesia disturbs reflexes.

More cases have died from simple tapping than have gone under from operation on the spot, apparently, yet I think it is safer to lessen pressure with the needle one day, and then excise 24 hours later, after tension conditions have become nearly equalized. In ticklish cases, I have often done this: with careful removal of fluid by aspiration, the patient may be brought to the operating room in much better shape. There is, of course, no considerable toxic absorption in the interval after the tension is reduced.

What happens when the chest is opened?

In the normal chest there is some sucking-in of air, but not much, if the hole is small. If much fluid is present, a jet of fluid is promptly thrown several feet with the first expiration. As a rule, the pleural reflex excites a cough and expulsion of fluid is violent for some time. Theoretically, if the parietal hole is large, there should presently be a collapse of lung again. In fact, there is nearly always sharp reëxpansion and the collapse does not occur till hours later. If the wound is well dressed, it often does not occur at all. Real collapse must occur if double

empyema is operated on, both sides at once; hence the practice of opening one side and only tapping the other. With efficient valve or suction dressings, the simultaneous operation, or at least opening one side after opening and dressing the other, should be quite safe.

What are the factors governing collapse of lung?

So far as empyema cases go, there are: previous collapse and compression, long continued, then unimpeded access of air from without, on the one side, and respiration with partial glottis closure on the other, supplemented by intentional or accidental valve action at the wound.

What are the symptoms of lung collapse?

In empyema there are none. Rarely does the lung collapse at any time, more than it has been collapsed by the effusion. Such vaso-motor troubles as arise are due to tension changes and to the reflexes of pleural irritation, not traceable to lung collapse.

As to intratracheal insufflation. Theoretically desirable, it has in fact, no place in empyema cases. The deep anesthesia necessary, in order to intube the trachea is too deep for safety in these cases. Moreover, the operation for empyema—rib resection and all—should be over in less time than it takes to anesthetize and to insert the tube for insufflation.

Positive pressure apparatus has no place here. I should hesitate to increase intrathoracic pressure in most cases; the heart load is heavy enough as it is! Neither positive intrathoracic nor negative external pressure are in the least called for, at the time of opening.

Next comes the question of drainage. Most important of all (next to making a hole) is the cleaning out of the cavity, and here is where many operations fail. In certain cases of streptococcus type, the fluid is thin and a small hole is enough. As a rule, however, we are dealing with the pneumococcus and with the massive fibrin layers that characterize this infection. If not removed, these masses inevitably clog any drainage, as they gradually disintegrate after about the third day. It is the presence of this fibrin that makes the mere insertion of a tube ineffective. Every empyema that will stand three minutes of operation, under light anesthesia, should have a resection of three-fourths to one and one-half inches of rib and an opening into the pleura big enough to admit a finger to sweep about and loosen the adherent fibrin masses. These may be fished out, or the patient may be so turned that the hole is at the lowest point. He will then cough out his own fibrin, and we can put the tube into a cleared cavity.

The old scheme of washing out the cavity is alluring, but not to be allowed at operation or later. I have myself seen two cases of dangerous collapse from irrigation, and there are recorded so many cases of such collapse, fatal in so many instances, that there can be no argument about the matter. What happens pathologically is not quite clear; it is, clinically considered, a vaso-motor affair, and the fatal cases die a "brain-death," long supposed to be embolism. Autopsies have never shown embolism, up to the time I looked the matter up. Let us call it the vaso-motor effect of a pleural reflex. At all events, it is too dangerous to trifle with; we may not irrigate!

As to the exact point for drainage, it does not seem to matter much. The Children's Hospital series I looked up long ago seems to prove double drainage of no sort of value. Whether we drain at the eighth rib or the eleventh is not important. We should drain behind, and the scapula is too low for drainage above the eighth. Very low drainage is interfered with by the ascent of the diaphragm during healing. Mechanically it doesn't seem to matter! Drainage depends on pressures, not primarily on gravity, and an opening at the level of the 8th, 9th or 10th ribs behind fulfils all requirements. I usually resect the 9th just below the tip of the scapula.

As to the tube, the spool tubes (Fowler's tubes) are neatest, but usually do not fit. Two tubes clog as easily as one. My own choice is a tube not less than one-third, or more than three-fourths of an inch, inside bore, fenestrated, reaching well into the cavity, not too long (2 to 5 inches, according to sizes of patients, and held by a safety pin outside the chest.

As to the dressing, it all comes down to a word: *drainage is best accomplished by whatever best promotes expansion.* We have here no ordinary cavity drainage; pus does not drivel out, but is, or should be, *pushed out* by the re-expanding lung!

The question of most importance then is that of reëxpansion. And the question of reëxpansion is the question of negative pressure. I believe absolutely that *most empyemas get well by accident;* get well because a sloppy, pus-soaked gauze dressing is a very fair valve.

For thirty years past, this problem has been rediscovered and all the means we have today have been reinvented, periodically. I did it all in 1900-1901, and was much shocked to find that Perthes and Revilliod had done it years before. It has all been done since, also.

There are many ways of getting negative pressure in the pleural cavity. The simplest is the wet dressing valve. A little better is the late A. T. Cabot's valve, dating back to the '80's, which was a flap of rubber tissue or gutta percha over the tube, held close by a "doughnut" dressing outside. Mechanically better is the siphon scheme, developed especially by Perthes, in which a trocar carrying a tube inside it is thrust in and the trocar withdrawn, leaving the tube *in situ*, forming a permanent drainage with siphon suction. Except that it does not solve the fibrin question, this would be ideal; in fact it is practically worthless.

The formal valve dressings we shall return to presently. For the moment let us take up the more exact negative pressure apparatus.

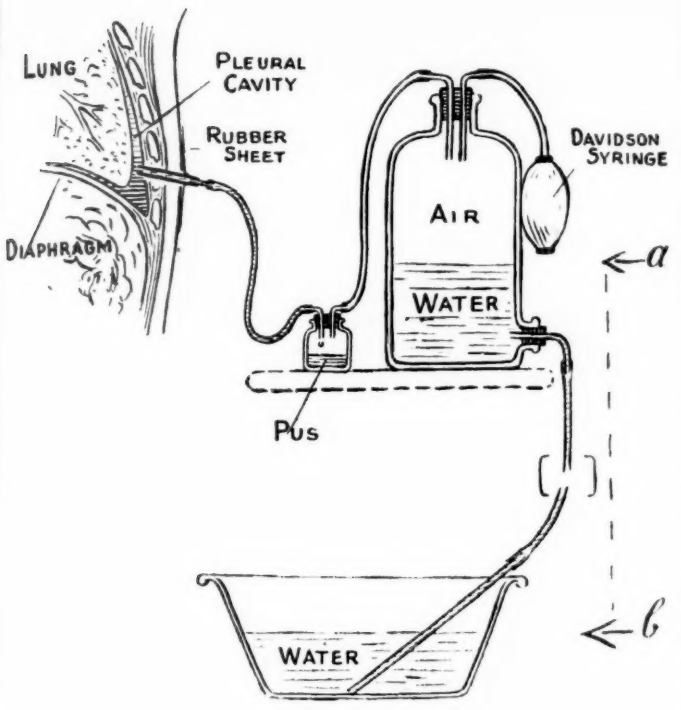


FIG. 1.—Suction Apparatus.
The difference between the levels *a* and *b* should not be over 20 inches. At about 30 inches, hemorrhage begins.

In 1900 I worked out and used at the Children's Hospital an exact apparatus of this sort, consisting of a tube in the wound, passing through and sealed to a square of rubber dam, covering the opening and the wound; held flat by adhesive straps, so placed at each corner as to produce light tension in the square of rubber and prevent wrinkling; held adherent by a film of glycerine between skin and rubber, with a tube leading from the drainage tube to a "catch-bottle" for pus; a bottle from which another tube led to a bottle serving as a negative pressure chamber. From this bottle, at the bottom, was a tube leading down to a pan of water. In the cork of the bottle was a tube connected with the bulb of a Davidson syringe. The difference between level of the fluid in this reservoir bottle and the level in the open pan below, was the measure of the negative pressure tension actually exerted on the lung. This tension could be increased by a squeeze or two on the syringe bulb.* I used this on twenty odd cases. It is not hard to handle, and I learned some facts.

1. Tension corresponding to a column of over 30 inches of water often produces pleural hemorrhage.
2. A column of over 20 inches is never advisable even in obstinate cases.
3. Ten inches is ordinarily enough.
4. Negative pressure increases transudation; the pus grows thinner but more in amount.

* This is almost exactly the scheme that I later found described by the Swiss surgeon Revilliod.

5. Absolute reëxpansion does not secure prompt healing though drainage be perfect. In cases with great prostration and low nutrition, even this exact apposition of surfaces may have to continue for weeks before we are secure against recurring collapse, when tension is removed.

This exact negative pressure is the ideal both as regards drainage and reëxpansion. It is a troublesome affair, however, and most nurses are a little dense about it.

From a practical point of view the valve is often efficient in convalescence, and in many cases from the beginning, if the patient will cooperate with us. The valve produced by sewing a skin flap over the end of the tube does not appeal to me. Theoretically, I object because it drains pus under the skin instead of outside it; practically, in all the cases in which I have seen it used, it failed to work—as a mechanical proposition. If we really want a valve, let's have a real valve!

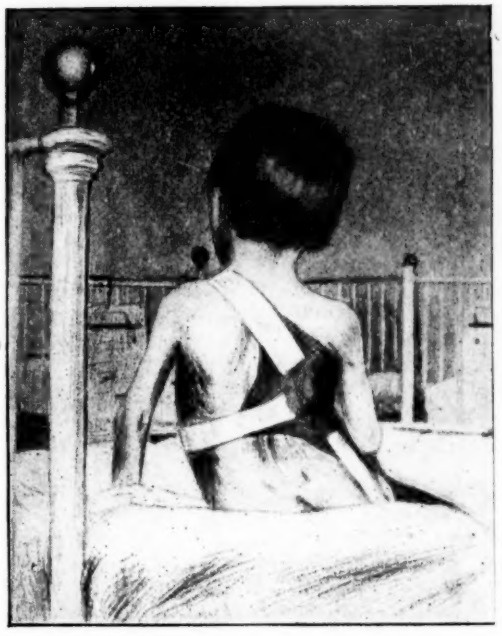


FIG. 2.—Valve Dressing in Situ.

All one has to do is to stretch a square of rubber dam over the tube end, *guy* it *under slight tension* with an adhesive strap at each corner, run a little glycerine under it and put on a swathe. That's all! The rest is mostly up to the patient. If he coughs or breathes hard, he will make the valve efficient; if he is languid, we give him the well known Wolff bottles to blow. Let him make it his life work, for the moment, to blow a red fluid from one bottle to the other, and his valve will work and his lung will expand.

The question is constantly under discussion of the treatment of chronic empyema. Leaving aside for the moment the indisputable fact that chronic empyema represents the results of in-

competent treatment of acute empyema,* let us see what is to be done with the chronic cases.

The favorite operations have been those of Oestlander and Schede. Both these are frankly deforming operations, applicable only to cases in which reëxpansion is despaired of; in which the lung is "given up." The operation is then one simply to enable the closure of a rigid-walled cavity by removing the bony support of one wall and letting it collapse. I can see where it may be admissible to do this is a cavity communicating with an open bronchus. There is nothing else to do in such cases, though I hope we shall presently have something better to offer than these frightful operations with their deforming results, to say nothing of the still high mortality.

Delorme's operation of decortication (latterly rediscovered by Fowler and tagged with his name in this country) offers more; gives a chance for the sick lung to reëxpand. Sometimes it does this without further ado—sometimes it does not. If it does not, it is our duty to aid reëxpansion by using negative pressure. Negative pressure in my hands has been so successful that in a considerable series of empyema cases (100 to 150) I have done no Schede or Oestlander operations, and but one Delorme operation, and even in this case, utilized suction apparatus and valve dressings to get complete cure. In one case, of many years' duration, with a leak in the lung, I have proposed a Schede operation,—proposal declined. This series includes one case of three years' duration, and a number of cases lasting many months before I saw them.

I believe that proper utilization of our knowledge of pneumodynamics, proper and intelligent use of negative pressure methods of various sorts, will leave us with a lower mortality, with fewer—nay, with almost no—chronic cases, and will furnish us with adequate means of treating such chronic cases as come to us without frequent resort to the radical and deforming operations of the past.

* Save in the rather rare cases in which a leak in the lung precludes proper treatment by negative pressure.

IV.

The Treatment of Chronic Empyema.*

By F. B. Lund, M.D., Boston.

The treatment of chronic empyema offers to the surgeon problems of the greatest interest and difficulty. The longer one's experience with this disease, the more one is struck with the variation in the problems presented. Encapsulated or localized empyemata present problems very different from the cases which occupy practically the whole chest, in which the lung lies in the costo-vertebral gutter, occupying often an inconceivably small space. Encapsulated empyemata may be anywhere in the chest: high up against the outer wall, between the inner surface of the posterior lobe and the vertebral column,—a position in which it may easily escape our diagnostic efforts,—between the lobes of the lung, between the inferior surface of the lung and the diaphragm; and in these various positions, require varying incisions and methods for their treatment.

The principles of the treatment of encapsulated empyema when chronic are no different from those of the general variety; but owing to the smaller size of the cavity, the problems presented are usually more simple.

The commonest causes of chronicity in empyema are: 1. Too long delay in the primary operation. 2. Inadequate or ill-placed drainage. Drainage, in the writer's experience, is likely to be inadequate when attempts are made to apply suction apparatus for the maintenance of negative pressure in the chest. In these forms of apparatus a smaller tube is apt to be employed than is the better practice, and while pneumothorax may be prevented, occasional plugging and backing up of pus are unavoidable, and these do more harm than would the admission of air in connection with a larger tube and drainage opening. The employment of a suitable valve, by the use of rubber tissue, or, as the writer prefers, of a valve of skin over an obliquely placed tube, to prevent the inrush of air into the chest cavity during inspiration, the writer believes, has an important place in favoring the expansion of the lung, and therefore the prevention of the formation of a stiff-walled non-collapsible cavity; in other words, of a chronic empyema. As this matter belongs not to the treatment of chronic empyema, but to its prevention, the description of the method of the oblique tube and skin flap will be given at the end of the paper, for the writer believes that he has found it of marked service in avoiding the undesirable conditions the treatment of which is under discussion.

When an acute empyema is opened and the pus evacuated, in ordinary cases we have a cavity left whose inner boundary is the surface of the compressed lung, and whose outer the chest wall with its ribs, intercostal muscles, spine, *et cetera*. It is evident that, if the lung at once expands to its normal size and can be made to remain in contact with the chest wall, the condition will be cured. In early operations, when the compression of the lung is easiest, this will take place; and if the anesthesia is light, or local anesthesia is employed, when the patient coughs at the end of the operation, the lung will come out and fill the opening; and if the inrush of air can be prevented at the same time that free drainage is maintained, the cavity may remain obliterated and the cure be rapid and complete. In old or neglected cases, where the pus has been present for a long time, however, the lung is

* Presented before The Massachusetts Medical Society, June 9, 1915.

covered with a thick coating of partly organized fibrin, which may be a quarter to a third of an inch thick. The surface of this membrane is concave to the examining finger and convex to the lung. It is stiff and leathery, and may be further reinforced by a chalky deposit of lime salts. It may and does so compress and bind down the lung that it does not expand, and after drainage a chronic suppurating cavity remains which can be closed only by the collapse of the chest wall down upon the lung, in such a way as to obliterate the cavity. This collapse in adults is prevented to a large extent by the rigidity of the ribs and cartilages, so that while nature, by the crowding together of the ribs and sinking in of the chest, may produce partial obliteration, a chronic suppurating cavity, though of smaller size, is left behind, and a constant discharge, with fever and malaise, emaciation and asthenia, are present. In children, whose softer bones and more movable cartilages may allow still greater collapse of the chest, chronic cavities may come nearer to obliteration in this way, but the obliteration is usually incomplete, and attended by distressing deformity of the chest, and curvature of the spine toward the affected side.

The earlier operators who attacked this problem all attempted to allow the collapse of the affected chest by resecting its bony walls. This object was attempted by multiple resections of greater or less portions of the ribs which formed the roof of the cavity, and with it the name of Oestlander, of Helsingfors, is associated. His monograph was published in 1879; and while multiple rib sections may have been, and probably were, done by others at about the same time, he deserves the credit of placing it upon a firm basis. He resected varying lengths of from four to six ribs, according to the size of the cavity, in order to allow the chest wall to collapse, and reported his successes and failures. The operation was tried everywhere, and with varying results. There can be no doubt that in the exhausted and febrile subjects of chronic empyema, the operation was sometimes formidable, and that in children permanent curvatures of the spine and collapse of the chest wall had to result. In the unsuccessful cases, the chest wall was found not to have collapsed sufficiently to obliterate the cavity. Such collapse, if it did not take place immediately after the operation, was later prevented by the regeneration of the resected ribs from their periosteum.

In 1890 Schede, of Hamburg, brought out his admirable paper, in which he first presented a real reason for the failure of the obliteration of empyema cavities, namely: that granulation tissue never grew from pleural surfaces, which fact tended to prevent adhesion and obliteration of empyema cavities even in fairly close contact. He also proposed his formidable yet logical operation of the removal of the ribs with the intercostal muscles and parietal pleura over the surface of the cavity and allowing the skin to settle down directly onto the surface of the lung.

This operation, while successful in those patients who survived it, is most extensive and attended by severe mutilation. Except in patients of extraordinary strength and vitality, it may be impossible to accomplish. If successful, it means an extremely marked deformity and collapse of the lung.

In 1893, Delorme, a French surgeon, suggested excision of portions of several ribs, sufficient to get the hand into the chest, to allow the peeling off or decortication of the thick, leathery layer of fibrin which covers and binds down the lung. He showed that by slitting the membrane longitudinally and inserting the finger under it, it may be peeled back, exposing the fresh, raw, bleeding surface of the lung. After it is thoroughly peeled back, and as far as possible removed, the patient at the close of the operation is allowed to come out of ether, and when he coughs the lung expands and fills the cavity of the chest; sometimes coming completely in contact with the chest wall, sometimes not. A tube is then placed for drainage of blood and serum, and a large adhesive dressing applied. This large adhesive dressing, if it can be left on for two or three days, becomes soaked in serum at once, and acts as a fairly efficient valve to prevent the admission of air in inspiration, so that when it is removed the lung may remain adherent to the chest wall. This operation was performed at about the same time by Fowler, in this country, but it seems to me on review of the evidence that Delorme reasoned the matter out and applied the principle intelligently, while Fowler blundered into it and did not know what he had done till afterward. However, the principle became gradually established, and Dowd, Lloyd and others reported its successful employment. Ransohoff advocated, instead of decortication, a series of multiple criss-cross incisions through the thickened pleura to allow the lung to expand.

Beckman, from the Mayo clinic, has recently published an interesting account of several successful cases.

The reasons why I personally prefer decortication I have given in a paper published in 1911. I have since that time seen no reason to modify the technic therein advocated. My own incision and rib resection for acute empyema is performed in the posterior axillary line and concerns the ninth or tenth rib, or both. With the primary incision in this situation, the empyema becomes chronic and decortication is necessary. If we start from this point to open up a cavity extending vertically the incision must be carried upward, and an inch or two of the eighth, seventh, sixth, and fifth ribs resected, and the pleura cut through; then the ends may be retracted, the cavity inspected, the hand introduced, the pleura incised with the knife followed by long scissors, and peeled away.

In case the primary drainage opening is further in front, say the seventh or eighth rib in the anterior axillary line, the necessary opening may

be made by carrying the incision backward and upward in the intercostal space and employing the rib retractor, as recently suggested and practised by Dr. John Homans. The wide springing apart of the tissues stiffened by long-continued infiltration may, however, cause serious embarrassment of respiration; and personally I think the result is attained more simply and with less shock by carrying the incision upward across several ribs, resecting an inch or two, and cutting across the pleura between. The bleeding from the intercostal arteries gives surprisingly little trouble, and may be easily controlled by clamps. However, the method of getting at the thoracic pleura which may suit one man will not suit another, and the main point is to get at it and get it off.

The employment of intratracheal anesthesia has been of the greatest benefit in these cases of chronic empyema, as it enables us to blow up the lung during the operation, to see the effect of what has already been done and determine as to the necessity of further procedures. The lung may thus be held against the chest wall till the operation is completed and the dressing applied, so that we are not dependent upon the spasmodic coughing of the patient, which works by contrast both irregularly and inefficiently.

In an interesting presentation of the subject by Dr. John Homans mentioned above, he refers to the fact that repeated operations are frequently necessary. This has been true in my experience. Decortication may be only partly successful and have to be followed by rib resection over a small area that refuses to heal. Rib resection may have to be supplemented by decortication. In the after-treatment, the use of the blow bottle, and the rubber valve proposed by Cotton, should not be neglected. A device which I have employed successfully in two or three cases is to leave several patches of membrane on the lung, while peeling off the rest, and passing catgut sutures through them as holding points, and suturing the viscera to the parietal pleura, generally carrying the catgut around a rib.

Schede's principle that the pleural surface does not granulate is met by decortication, in that the actual visceral surface layer of the pleura, which consists of a single layer of cells, is scraped off, leaving a bleeding raw surface. The parietal pleura also ought to be removed to bring the granulating surfaces into contact. Personally, I have found the attempt to peel the parietal pleura off the concave, rigid, inner surface of the chest too difficult, bloody, and exhausting a procedure, and so far have succeeded or failed without it.

Of recent years, considering the large number of acute empyemata at the hospital, we have had a surprisingly small number of chronic cases to treat. This is due, first, to early operation; the cases are frequently now transferred from the medical side before the exudate has become more than sero-purulent; second, to the thorough removal of the fibrin; third, to adequate dependent drainage; fourth, to the valve, either of skin or rubber, applied over the tube; and fifth, to the less frequent dressings during the after-treatment, and the prevention as far as possible of the entrance of air while allowing the escape of the pus.

In a recent case of double empyema on my service, the application of these principles has led to a brilliant success in a case that on one side at least had threatened to become chronic.

In my own experience, as in that of Dr. Homans, multiple operations have been necessary, especially in the long-continued cases of empyema totale, where the cavity has occupied the whole chest. In these cases, multiple operations have been frequently required, and there have been failures and fatalities. In localized chronic empyamata, decortication has usually given most brilliant results, and been successful the first time.

Decortication is not a cure-all or specific. It must be thoroughly and intelligently used, and must be preceded and followed by all the tricks and dodges which experience can suggest to secure lung expansion, except those methods which imply suction apparatus and provide an inadequate drainage opening. It may have to be supplemented in certain obstinate cases by rib resection.

On the whole, however, and properly used, we must regard it as an invaluable method in cases where the later simple methods fail to cure, and the ultra radical methods are sure to kill our patients.

I hope an increasingly large number of surgeons will familiarize themselves with the method and become acquainted with its advantages. It is not a minor operation, to be undertaken lightly; nor is it, on the other hand, of difficult technic. It looks the first time like a bloody and difficult procedure. It requires, among other things, good judgment as to how far to go and when to stop. It gives brilliant results. All of which ought to make it interesting to the surgeon.

I think it may be regarded as fair in this paper to allude to a device of extreme simplicity which has been of the greatest value to me in the treatment of acute empyema, and therefore the prevention of the chronic form, an arrangement which is of special value during the first few days of the treatment, when the maintenance of the expansion of the lung is of the greatest importance, and which in my experience has often secured such expansion as to allow the removal of the tube in three or four days. It consists in the use of the skin as a valve over an obliquely placed tube.

An incision is made over and parallel to the rib, below the one to be resected, and is about four or five inches long. The upper margin is retracted upward to the level of the upper border of the rib above, which is resected. The

tube, just long enough to reach from the lower border of the skin wound into the chest, is cut very obliquely, so that in place the skin lies over its wide opening without being pushed up. The extreme lower margin of the tube, opening outward, is sutured to the lower margin of the wound. The skin flap, formed by dissection, is sutured on either side of the tube to the lower margin of the skin wound, and on inspiration will be sure to suck in over it and prevent the entrance of air. On expiration, the skin is blown outward and allows the pus to escape.

This is very simple and cannot get out of order. When the tube has to be removed, say in four or five days, no more drainage may be necessary as the lung has often expanded. If it is necessary, then or later, one of the rubber valves may be better. For the first few days, however, the skin flap has very great advantages. It cannot get out of order, does not require attention, affords free drainage. The pressure of a tight bandage over it only renders it more efficient. Some of my friends, as well as myself, have found it very useful.

V.

Lung Abscess and Bronchiectasis from a Surgical Point of View; Certain End Results of Acute and Chronic Empyema.*

By Wyman Whittemore, M.D., Boston.

I have been asked to speak to you on the surgical aspect of lung abscess and bronchiectasis; and to give you certain statistics of end results of acute and chronic empyema.

Several months ago I looked up and published in the Boston Medical and Surgical Journal the end results of cases of acute and chronic empyema at the Massachusetts General Hospital.

I traced as far as possible the cases operated on from January 1, 1901, to January 1, 1911.

I was a good deal impressed by the fact that out of 269 cases of acute empyema operated on during this time, there was a mortality of 20%, and that out of one hundred cases that left the hospital alive, 20 became chronic.

Out of 154 of these cases that have been traced to a definite end result, there were 54 that died following operation (giving a mortality of 20%). Of the 100 cases that left the hospital alive, 68 are well at the present time. By this I mean that there is no discharging sinus, no bad effects from operation, and that they are able to attend to their regular occupations. Twenty became chronic. These have a persistent sinus and a cavity with a much thickened pleura as a rule, and are more or less chronic invalids. The remaining 12 have died since leaving the hospital. I was able to find out the cause of death in nine of these. There was no connection between the cause of death and their empyema.

An autopsy was performed on thirty of the cases that died following operation; 14 died from septicemia, 5 from pneumonia, 3 from pyemia, 1 from peritonitis, 2 from multiple abscesses of the lung, 1 from defective closure of the foramen ovale and thrombosis of the left pulmonary artery, and in 4 no definite cause was found. The most common cause of death was septicemia, the majority being streptococcus septicemia and a few pneumococcus septicemia.

There were 35 cases of chronic empyema operated on during this period of ten years. I have traced the end results in 23; 15 are entirely well, 4 did not improve by operation, that is, they have a persistent sinus and are chronic invalids. Two cases died following operation, and 2 have died since leaving the hospital; cause of death not known. Of the 2 cases that died in the hospital, one had an autopsy performed, cause of death being adeno-carcinoma of the main bronchus and extensive bronchiectasis.

The various classical operations were performed: 4 cases had an excision of ribs and parietal pleura excised (Schede operation); 2 are well, 2 not traced, no mortality. Five cases had a decortication of the lung (Fowler operation); 3 are well, 1 did not improve, 1 died; a mortality of 20%. Twenty-one cases had an excision of ribs and pleura curetted (Oestland operation); 1 died, giving a mortality of 5%. Seven are well, 2 not well, 2 have died since leaving the hospital. The remaining nine have not been traced. The other cases had minor operations performed, as, for example, the removal of an old drainage tube or merely curetting the sinus. All these cases are well with one exception.

I feel that the subject of bronchiectasis is almost entirely a medical one. However, a certain amount of surgery has been done. I have tried to take a position between the euthusiastic thoracic surgeon and the more or less pessimistic medical man.

I shall not take up the bacteriology, symptoms or diagnosis.

A few of the causes of bronchiectasis are the following: Unresolved lobar and broncho-pneumonia. Stenosis of the bronchus from a new growth in its wall. Inhalation of foreign bodies. Pressure on the bronchus from outside, as, for example, from an aneurysm or mediastinal tumor. In rare cases bronchiectasis follows a chronic empyema.

In the majority of cases the disease is located in more than one lobe. Occasionally it is in both lungs. The cavities vary from a minute size to those as large as a hen's egg. Where the disease is due to the inhalation of a foreign body or to stenosis of a bronchus it is unilateral for a time at least.

Surgery has nothing to offer to those cases in which the disease is in both lungs. But where

* Presented before The Massachusetts Medical Society, June 9, 1915.

it is unilateral, especially if limited to one lobe, the surgeon may feel a little more hopeful of eventual success.

Various surgical procedures have been undertaken. When one thinks of the pathology of the disease, one realizes the hopelessness of trying to establish drainage. This may be undertaken as a last resort in cases of complicating gangrene in order to save life, but the outlook is far from favorable.

Some years ago it was found that certain cases of tuberculosis were benefited by partly or completely collapsing the lung with nitrogen gas, and thus it seemed possible that bronchiectasis might also be benefited by collapsing the lung. This has been done in two ways: by extensive rib resection and by the introduction of nitrogen gas. Neither method has produced many good results.

Extensive rib resection has certain dangers:

1. Sudden collapse and death from disturbance to the respiratory and circulatory mechanism.

2. Through the patient's cough being checked following operation on acount of pain, the secretion accumulates and may flow over into the other lung.

3. Spreading of the infection through the whole system, so that the patient dies from a septicemia.

Four cases have been operated on at the Massachusetts General Hospital. Two died following operation. In both cases an autopsy was performed. One case died from a pneumococcus septicemia, the other case showed extensive bronchiectasis and pneumonitis with areas of necrosis in the lung. The other two cases left the hospital alive. One of them is no better, having the same symptoms as before operation. The other case is well. He was last heard from two years and two months after operation.

The introduction of nitrogen gas into the pleural cavity, thus producing an artificial pneumothorax and causing a partial or complete collapse of the lung, has been tried in some cases, particularly in those where the pleura is not adherent.

I have been unable to find any end results of this method. One case has been treated in this way at the Massachusetts General Hospital, but that case has not been traced.

A third method is that of lung excision. This can be attempted when only one lobe is diseased, which is exceedingly rare. The successful cases have followed a series of previous operations that have brought about a contracture of the diseased lobe.

It is the ambition of thoracic surgeons to do this operation in one stage, but up to the present time almost all patients so operated on have died.

The pneumothorax following operation is dangerous. Fluid may accumulate in the pleural cavity, and this may become infected, either from previous infection or from leakage from the bronchi at the root of the lung.

The whole circulatory and respiratory mechanism is suddenly upset.

It seems better, therefore, at the present time to allow the patient to become accustomed to the change in circulation and breathing by a retraction or collapse of the lung previous to excision.

I have been unable to get any satisfactory end results. Some half dozen surgeons have each reported one or two successful cases. But how many unsuccessful ones they have had I have not found out.

There has been one case at the Massachusetts General Hospital. This was successful. It was operated on in 1909 and reported in 1912 by Robinson. This case had several operations previous to excision of the lower lobe, so that there were many adhesions and the lobe was more or less contracted. The patient made an easy and excellent recovery. Several months after operation he had four small bronchial fistulae. Two of these were successfully closed. Two years later he was in excellent health. In 1913, four years after excision of the lobe, he died in Canada, but whether or not his death had any connection with these operations is not known.

In marked contrast to bronchiectasis I feel that the treatment of lung abscess belongs to the surgeon in the great majority of cases.

The symptoms, bacteriology, and diagnosis I shall not take up.

The chief causes are lobar and broncho-pneumonia. A good many cases are due to the inhalation of foreign matter. For example, the inhalation of blood and mucus during operations on the nose and throat or during the extraction of teeth while the patient is under a general anesthetic. Occasionally a real foreign body has been found. In one of my cases, a child, a small piece of a peanut was found. An embolism from an infected thrombus may become lodged in the lung and thus start the formation of an abscess. Occasionally an empyema may rupture into the lung, but I believe this is more apt to cause gangrene than an abscess. Actinomycosis is a definite cause. There have been two such cases within a year or so at the Massachusetts General Hospital. Occasionally there is a case following abdominal infection.

The diagnosis is entirely in the medical man's hands.

An abscess may be in any part of the lung, although it is said that they occur more frequently in the lower lobe than in any other, and are apt to be near the pleura. But in my limited experience I have not found this to be necessarily true.

The x-ray is extremely important in definitely locating the abscess before operation.

The prognosis depends upon various factors, and in each case it must be determined separately. It depends upon the general condition and age of the patient, and to a certain extent upon the location of the abscess; as one situated

in the posterior part of an upper lobe is much more difficult to approach and find than one near the pleura in the lower lobe. It also depends upon the duration of the process, the theory being that an acute case tends to recover more readily than a chronic one, because in a chronic case the surrounding connective tissue may prevent the abscess walls from collapsing. I am not sure that this necessarily works out in actual practice, as I have seen several chronic cases get well as rapidly as acute cases after operation.

The prognosis is better in cases of a single abscess than in those in which there are several.

It should be remembered that a complete recovery may occur spontaneously, but this is extremely rare.

I think the general feeling is that if an abscess does not show signs of marked improvement in two or three weeks it should be operated on.

In the operation for lung abscess I believe intratracheal ether should always be used, although cases have been successfully operated on without it. My reason for this is that there is a good deal of danger of making an opening in the pleura and collapsing the lung when, as is very often the case, the pleura is not adherent. One can never tell before operation whether the pleura is adherent or not. By using intratracheal ether this danger is done away with. Besides which the ether can be accurately adjusted, the embarrassment caused by spasm of the glottis, the accumulation of mucus in the pharynx and the dropping back of the tongue are entirely avoided.

Robinson has collected 1400 cases of intratracheal ether from 35 surgeons. Of these, seven died after the operation, of which only two were credited to the method. In one a broncho-pneumonia was induced and in the other death occurred following emphysema, in which it is stated that a rupture of the lung took place, as a result of the tube being forced into one of the main bronchi. Tracheitis and pharyngitis occurred in only 18 cases.

Sometimes the patient while going under ether will cough so severely that he will completely empty the abscess cavity. This latter may be very disconcerting when one is expecting to demonstrate the opening of an abscess.

It is much safer to do the operation in two stages, and quite necessary to do so when the pleura is not adherent. For although the lung may be well sutured to the pleura before opening the abscess, yet there is great danger of leakage of septic material into the pleural cavity that will eventually form an empyema.

A large skin and muscle flap should be turned up and a section from three or four ribs in the region of the abscess removed. The intercostal muscles should then be cut away and the field made perfectly dry. If the pleura is not adherent, and it frequently is not, the lung can be seen moving under it. Two or three sponges are then laid against the exposed pleura and the skin and muscle flap sutured into place. It is not necessary to suture the lung and pleura, but it may be done before laying the sponges on.

After three or four days at the second stage of the operation, the pleura will be found to be firmly adherent to the lung. An incision is made through the pleura and into the lung, and the lung explored for the abscess. One can explore with a trochar, but I feel it is better to use one's finger as the trochar may puncture a vessel and cause severe hemorrhage. When one is lucky one opens into an abscess with frank pus. However, in a few cases an indurated mass is broken into, from which comes foul smelling bloody material, with perhaps a very little pus or even none at all that is visible. A soft rubber drainage tube should be fastened in and the skin partly closed.

Some of the dangers attending operation are: sudden respiratory disturbances, collapse and death soon after the operation; pneumothorax, empyema, or hemorrhage into the bronchi. One case has been reported in which a blood clot lodged in the larynx.

The first few days following operation are often stormy, as there may be considerable shock. The patients frequently cough a great deal on account of the irritation of the tube in the lung. After three or four days this gradually quiets down and in a week or ten days the tube can be replaced by rubber tissue, which will not be so irritating.

The end results of cases of lung abscess at the Massachusetts General Hospital were looked up and reported by Dr. Lord in 1906. Last year Dr. Scudder reported 16 additional cases. I have combined these two reports to get the following statistics:—

There have been 27 cases operated on: 8 are entirely well, 2 did not improve following operation, 2 have died since leaving the hospital, cause of death not known, 8 have not been traced, 7 died following operation, giving a mortality of about 25%. Three of these died from multiple abscesses of the lung, 1 from multiple abscesses of the lung and liver, 1 from multiple abscesses of the lung, liver and brain, 1 from septicemia, and in 1 case the cause of death is not known.

As a summary I should say:—

First, that although the operation for acute empyema may be a very simple one, yet the results have been far from satisfactory.

Second, that after an acute case becomes chronic, the outlook for the patient becoming a useful member of the community is very questionable.

Third, I consider that surgery has very little, if anything, to offer cases of bronchiectasis at the present time.

Fourth, the surgery of lung abscess is most encouraging, and there are constantly a greater number of cases being successfully operated on.

This, I think, briefly covers what surgery has been able to accomplish along these lines up to the present time. They are subjects in which

more and more interest is being taken, and I think I am not too optimistic when I say that we look with confidence towards future results.

REFERENCES.

Robinson, S.: Pneumectomy, Its Possibilities, Annals of Surgery, April, 1912.

Scudder, C. L.: A Report of the Cases of Lung Abscess at the Massachusetts General Hospital Clinic, BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxxi, No. 14, Oct. 19, 1914.

Lord, F. T.: Diseases of the Bronchi, Lungs and Pleura.

Robinson, S.: Intratracheal Ether Anesthesia, Surgery, Gynecology and Obstetrics, March, 1913, pp. 296-301.

Lord, F. T.: The Diagnosis and Treatment of Abscess and Gangrene of the Lung with Special Reference to Operation, International Clinics, Vol. ii, 16 series, 1906.

Mumford, J. G., and Robinson, S.: The Surgical Aspects of Bronchiectasis, Annals of Surgery, Vol. 60, July, 1914.

Whittemore, W.: Acute and Chronic Empyema at the Massachusetts General Hospital, BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxxii, No. 5, Feb. 4, 1915.

Whittemore, W.: Two cases of Lung Abscess Cured by Operation, BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxx, No. 11, March 12, 1914.

DISCUSSION.

DR. G. G. SEARS, Boston: The pathological conditions which have formed the subject of this meeting may all be grouped under one general heading—non-tubercular suppuration of the lungs and pleura. As it is a surgical axiom that pus should be evacuated, if possible, the problem which these conditions present is whether or not to operate, and when and where.

Since the conservatism of the internist toward surgical procedures has been criticized this afternoon, I would remind the audience that the pioneers in lung surgery,—Lenhartz, Quincke, Mosler and Brauer,—were all essentially medical men who recognized the inability of medicine to cope with these processes and turned to surgery as the only sure means of effecting a cure.

The first essential of successful treatment is an accurate and early diagnosis, for if operation is indicated it should be one of choice and not of necessity. We cannot lift the lid as in abdominal cases and explore the contents of the chest from conviction that there is something wrong within it. A clear idea of the site and character of the lesion is a necessity. I fear that Dr. Brown, perhaps from an appreciation of his own difficulties in interpreting the x-ray findings in spite of, or possibly because of, his large experience, has spoken more flatteringly than is justified of the results obtained by physical examination at the bedside, since the most careful clinical examination must at times leave the diagnosis in doubt, and while the x-ray is frequently not required, it is often indispensable and may lead to a radical change of opinion.

Recent literature seems to show the great value of the bronchoscope. It appears to have been neglected here in Boston, but I hope that we may soon have a corps of men trained to give help in this way in doubtful cases.

What I have to say will be largely confined to empyema on account of its great clinical importance, partly because it is the commonest of the lesions under discussion, and partly because, when neglected, it leads to other suppurative conditions in the lungs. Its detection is often difficult. As I look back over my own failures I am convinced that they resulted almost invariably from neglect to lay sufficient stress upon three fundamental propositions which almost deserve to be classed as axioms. The first is that unresolved pneumonia is a pathological myth. If the temperature keeps up and the signs persist after due course of time, something is amiss. If we can exclude complications outside the lungs as a cause of fever, *e.g.* otitis media, pericarditis or endocarditis, we arrive at a diagnosis by exclusion of either pulmonary abscess or empyema, and of these the latter is vastly more common. The second proposition is this—that the diagnosis of pleural effusion is made with the fingers, not the ears. The decisive signs of effusion are absence of fremitus, dullness on percussion and displacement of organs, all of which are made out with the hands. Corroborative evidence may be obtained by auscultation, but quite as often the stethoscope leads to confusion, for we may find loud bronchial respiration, loud bronchial voice, not always oegophonic, and even râles.

The third proposition is that when one is in doubt between a pleural effusion and consolidation of the lungs, it is always the former.

These are generalizations, and all of you will recall numerous exceptions, but the point to be emphasized is that under such circumstances the burden of proof is on the physician to show that it is not an empyema. If not completely satisfied he should summon other aids; among these the x-ray is most important, but the value of the aspirating needle should not be overlooked. Repeated punctures may be necessary to discover the site of the pus. I agree with what both Dr. Lord and Dr. Lund have said regarding possible dangers from the needle, particularly in the presence of suspected pulmonary abscess, but if care is taken in the selection of cases more harm is done by not using it than by using it, for an empyema may be of small size and lurk in unexpected places. It may occupy but a small space between the visceral and parietal pleura, it may be interlobar, or it may be located just above the diaphragm. The latter situation adds one other element of difficulty because the symptoms may be chiefly abdominal and simulate those of subdiaphragmatic abscess or appendicitis. In order to illustrate how confusing such a case may be I will give briefly the history of a patient seen a few years ago in the northern part of the state. He was a young man who had been complaining for several weeks of pain over his right hip. At first nothing was found to account for it, but later a large right-sided pleural effusion developed. The temperature curve was so suggestive of pus that the surgeon, who had been called in consultation, immediately opened the chest without previous exploratory puncture—nothing but clear serum escaped. After the operation his temperature continued its previous course, his general condi-

tion grew worse, and at the time of my visit he was in a very critical state. Physical examination, owing to the free opening in his chest, was of little value so that the diagnosis of the underlying lesion rested largely on the history, which seemed to me to point to an appendicular abscess which had extended upward under the diaphragm, the pleural effusion being secondary to that. As operation appeared to give the only possible chance of recovery the region between the liver and diaphragm was explored but nothing was found except some soft recent adhesions. Failing here, his chest was again opened and a small collection of pus above the diaphragm was found. His temperature then fell and he recovered sufficiently to leave his bed, when a purulent pneumonia developed and proved fatal.

There is one etiological factor causing suppurative processes in the lungs which I do not think has been mentioned this afternoon, namely syphilis, yet it deserves strong emphasis. In spite of the great advance during the last ten years in our knowledge of the disease we have hardly begun to make a clinical application of that knowledge. Most of the cases still pass unrecognized and masquerade under other diagnoses.

DR. JOHN HOMANS, Boston: So many very interesting points have come out in this symposium that I shall confine my comments principally to the papers of Dr. Cotton and Dr. Lund, for it is with their subjects that I am most familiar.

I am in thorough agreement with all that Dr. Cotton had to say as to the dynamics of intrathoracic surgery. It seems to me that the expansion of the lung after operation in acute or chronic empyema depends on the establishment of a moderate amount of negative pressure. It depends also apparently on the amount of vitality and enthusiasm which the patient has. In other words, a patient adequately drained and with negative pressure applied in some form, may never cough, may lie supine in bed, and make a poor recovery. I have such a patient now who is perhaps getting well, but I am trying to arouse a little enthusiasm, even trying to make him excited, so that he will show a little more interest.

Dr. Cotton spoke of using a long tube for drainage of acute empyema, and I think that this is a very important matter. The tube should go well within the chest,—if not, it very often happens that in the early part of convalescence the lower part of the lung will stick to the chest wall, perhaps above the end of the tube, gradually shutting off the rest of the empyema cavity from outside. I believe that the tube should be left a long distance within the chest wall,—a soft tube, to be sure,—and left in until the large cavity becomes a broad, flat cavity, the flat cavity becomes a broad ribbon, the flat ribbon becomes a narrow ribbon, and finally closes.

As to chronic empyema, I should like to arbitrate between Dr. Lund and Dr. Cotton. I do not quite agree with either, and the arbitrator should always expect to be abused by both sides. I am inclined to think, judging from the several operations of decortication I have done, that unless the membrane covering the lung is so placed as definitely to hold down the borders of the lung and prevent it from expanding, a matter which Dr. Lund himself pointed out to me once, it is not so very necessary to remove the false membrane which covers the visceral pleura. It is likely that if proper drainage is established such a cavity will close. If the surface of the lung is convex the lung can never expand further unless the membrane is removed.

Neverthless, I am inclined to think that if cases of chronic empyema were thoroughly drained with a large opening, a large tube placed well within the cavity, and a proper valve applied, that this should be done before the operation of decortication is attempted. If that does not produce the desired result, decortication should be tried. In this I am reversing a belief which I formerly held, or rather, I am not quite sure enough of the indications for decortication to propose it until proper drainage has proved a failure.

As to the access to the cavity, Dr. Lund spoke of an operation, which I have done, of going between the ribs. This I think it dangerous, and do not recommend it, for when the ribs have been spread apart some distance it seems to me there is grave danger of tearing into the mediastinum. In future I should excise several ribs, according to Dr. Lund's method.

As to the failure of granulations to grow in the pleural cavity, that is a very interesting matter. It is apparently a part of a tendency of the thoracic cavity to pour out fibrin in enormous quantity when it is infected. This seems to me to be due to the kind of bacteria which are present, rather than to peculiarities of the pleura, for there is not any difference which we know of anatomically between the pleura and the peritoneum. It is not surprising that this fibrinous exudate forms a thick membrane on the outside of the lung, and being composed of many layers of fibrin it has a very poor blood supply, never organizes well, and will not adhere to an opposing surface, as Dr. Lund has said, for a very long period. This is one of the important matters to consider in treatment. If the cavity is such a shape that it is unlikely to close by any mechanical means, then its walls must be rendered collapsible, or the lung must be made to expand and fill it. In either case the thick false membrane must usually be removed from the lung or from the chest wall if the cavity is to be permanently obliterated.

As to the operation for abscess in several stages, which Dr. Whittemore has spoken of, I think that principle might well be applied to other lesions than abscess. I feel very strongly that in operating on those patients with chronic empyema, who have been sick for a long time, it is better to begin slowly, and if you can get their

confidence and if they are willing to stay in the hospital, operate by degrees, by rib resection first, then exploration of the chest, and drainage. Such patients improve enormously as the result of perfect drainage, and it seems only fair never to impose on them at first any radical operation which is at all likely to be fatal, because these operations are not necessary as immediate life-saving procedures in chronic empyema, though they may perhaps be in lung abscess.

DR. J. S. STONE, Boston:—Empyema in children is essentially the result of poor hygiene. About fifty cases are treated each year at the Children's Hospital. They come for the most part from the more crowded sections of the city, where the children get little fresh air and sunshine. This is in striking contrast with the not exceptional experience of a physician with a large practice in a healthy suburb, two cases in twenty-one years.

Empyema in children is almost invariably a sequel of pneumonia. In pneumonia in children there is very commonly an involvement of the pleura as well as of the lung. The degree of pleural involvement and the power of resistance of the child determine whether an empyema results. The previous health of the child, as well as the care and surroundings during the acute illness are thus important factors in the incidence of empyema.

The empyema may be general, or localized by limiting pleural adhesions. When localized, the ordinary site is in the lower posterior part of the chest. A very few are interlobar. Any localization is possible. I have operated upon one patient in whom the pus lay between the lung and mediastinum, behind the second costal cartilage, close to the sternum.

The possibility of the direct extension of empyema beyond the pleural cavity and of metastatic foci of infection must be borne in mind.

Occasionally, of course, empyema is seen as a part of an overwhelming and obviously fatal infection of the serous membrane,—pleura, pericardium, meninges, joints, peritoneum. No treatment can avail in such cases.

During the convalescence from an ordinary empyema a metastatic peritonitis may develop very suddenly. In such instances the peritonitis is not secondary to disease in any abdominal organ. Such infections are easily overlooked at first because the explanation of the fresh symptoms is sought for in the chest. Vomiting, abdominal pain and tenderness, wherever located, are the symptoms upon which the diagnosis must be based and prompt surgical intervention undertaken if disaster is to be averted.

Such cases differ absolutely from those in which the pus reaches the abdomen by direct extension. At the present time such cases are less frequently seen than formerly. The catalogue of the Surgeon-General's Library gives one at a glance the literature of empyema about thirty years ago. It is a record of the various places into which an empyema may extend,—stomach, intestines, esophagus, lung, bronchus.

I want, however, to call particular attention to the extension of the process below the diaphragm into the extra-peritoneal tissues.

Three cases of empyema discharging at the umbilicus have been treated in the Children's Hospital. In one there had been a perforation of the central fibrous portion of the diaphragm between the reflections of the peritoneum above the liver. In two the spread of the pus occurred behind the crura of the diaphragm in the space through which the lymphatics and other structures pass. The pus in either case extends into the retroperitoneal fatty and cellular tissues. It burrows here with great ease, spreading downward into one or both loins, dissecting away the peritoneum from the muscles outside of the semilunar line, until it reaches the lower portion of the rectus muscle, where there is no posterior rectus sheath. The pus then dissects off the peritoneum from the lower part of the rectus muscle until it reaches up to the navel, where it obtains a vent.

Such cases cannot recover until the pleural cavity is properly drained. There is no peritonitis at all in such cases. The process is wholly extra-peritoneal.

The mechanical side of the treatment has been very thoroughly discussed. Two points deserve emphasis,—thorough drainage and complete immediate expansion of the lung. Thorough drainage requires rib resection. When the internist can predict which cases have masses of fibrin in the effusion and which do not, the surgeon may safely consider simple incision in the latter class. But that time has not yet arrived. Rib resection can be done through a very small incision and in a very brief time,—less than two minutes.

Complete expansion of the lung is helped by extremely light anesthesia. The coughing reflex should not be abolished. The fear of a too sudden expansion is, in children at least, a bugaboo.

Chronic empyema is seen in children practically only after an operation which has not resulted in a cure. In such cases, where much and often very foul, pus has accumulated in the chest, it is wise to be content at first to drain off the pus and later to secure expansion of the lung. The danger of septic absorption is minimized.

The prognosis of empyema in children varies greatly with the age. Children over two years old usually recover. In those under a year recovery is a rare exception. In those between one and two years old the outlook is extremely uncertain. Death is not due to any mechanical cause, such as the backing up of pus. It is due usually to the non-resistance to the infection. The infection often shows itself in patches of pneumonic consolidation in different parts of each lung. Death in the young children usually occurs after a few weeks of gradual failure in

the general condition. The power of resistance fails. Fresh air, sunshine, and good food are the only means of help. The aim of sanitarians must be to do away with tenement house conditions if empyema is to be prevented. Physicians must aim in cases of pneumonia to prevent empyema, if possible, by the best hygienic surroundings during the illness.

DR. FRANK L. RICHARDSON, Boston: It seems to me hardly possible that anything more of value can be added. Most of the readers, however, have not mentioned, or have only slightly mentioned, the question of anesthesia. This plays a considerable part in the recovery of patients, especially in the acute cases. It is my personal opinion that acute empyema in adults, where it is possible, should be operated on under local anesthesia. This avoids a certain amount of anesthetic shock and the thing which always follows ether anesthesia, the lessening of phagocytosis. In children, of course, it is not possible to use local anesthesia to such an extent as it is in adults, and here, as Dr. Stone has pointed out, a very slight anesthesia is desirable. It is only necessary to have your patients unconscious to perform your operation. It is not an operation of great delicacy, and if your patient is under lightly you can make him cough at any time, thus expanding the lung and driving out the pus.

In chronic empyema it is an entirely different story. Where decortication is to be performed, I think it is quite essential that intratracheal insufflation should be used, because here you can control the expansion of the lung very easily. This facilitates the work of the surgeon, and facilitates the work of the patient after the operation is over,—that is to say, if you have expanded the lung and filled the pleural cavity there is so much less for the patient to do.

Lung abscess presents an entirely different question. The cases of lung abscess that I have seen do not respond kindly to ether anesthesia. They cough very badly. They cough up sputum which is loaded with bacteria and there is always the chance of their inhaling some of this material and forming new abscesses. This is very much increased where they are under ether anesthesia. Now chloroform, in my hands, in these cases has proved very satisfactory. The chloroform anesthesia does not irritate the lungs as ether does, and patients have little or no coughing.

I want to encroach on the surgical side of lung abscess for a moment. I think this operation should be done in two stages wherever possible,—the first stage to get your pleural adhesions and the second stage for drainage. These two operations under comparatively light anesthesia I am sure do less harm to the patients than one single operation.

DR. WALTER M. BOOTHBY, Boston: Dr. Cotton referred several times to the dangers of "pleural reflex." Deaths occurring during empyema operations have not been uncommon; that they are due to reflex irritation of the pleural surfaces is, however, by no means proved. He advises freeing and removal of the fibrin by any handy instrument such as a sound, but opposes the use of an irrigation. Why should the sound cause less "reflex" dangers than the salt solution, especially when the cavity has just contained a litre or more of fluid?

Reflexes, if they occur, would in all probability be transmitted through the vagus nerves. Last year, in order to investigate the possible functions of the vagi over the respiratory mechanism,* Dr. V. N. Shamoff (of Petrograd) and I divided on both sides the pulmonary branches of the vagi. This operation necessitated a great deal of handling, cutting and tearing of the pleura, as well as the application of repeated direct mechanical stimuli to the nerves themselves. In none of the animals operated on did we obtain any evidence of "pleural reflexes." In our earlier experiments we had a few sudden deaths on the table due to an improper conduct of the intratracheal anesthesia.

Dr. Whittemore advised the use of intratracheal anesthesia when operating on cases of lung abscess as it would allow the lung to be expanded during the operation. Expansion of the lung is, of course, desirable, if it can be done safely. However, in cases in which the abscess cavity contains an appreciable amount of fluid or is connected with an intrapleural cavity containing fluid, the presence of a tube would be the source of added danger by preventing a free outflow of the pus through the trachea; furthermore, the current of air would tend to blow the pus down into the depths of the opposite lung, with the likelihood of the formation of secondary abscesses. I agree with Dr. F. L. Richardson that under these conditions intratracheal anesthesia would be contra-indicated.

DR. WYMAN WHITTEMORE: In regard to intratracheal ether, which has been said to be dangerous in lung abscess, I believe that it is necessary for the reason that I gave in my paper.

Although ether may be a bad thing to give, yet intratracheal ether I consider a great deal safer than ordinary ether in these cases.

DR. PERCY BROWN: I wish merely to note the spirit of the true internist which has actuated Dr. Sears to speak so modestly concerning the question of the medical diagnosis in these conditions. For my part, I am sure that dependable roentgen diagnosis in pleural cases would have no cause for being if it had not been stimulated by the support of internal medicine.

Dr. Sears's mention of the more routine use of the bronchoscope is an important matter. Systematic bronchoscopy as an especial work would be welcome. Some of our younger men, it is to be hoped, may deem it wise to take this matter up.

* Boothby and Shamoff: A Study of the Late Effect of Division of the Pulmonary Branches of the Vagus Nerve on the Gaseous Metabolism, Gas Exchange and Respiratory Mechanism in Dogs. Am. Jour. of Physiol., Vol. xxxvii, No. 2, pp. 418-431, 1915.

DR. F. B. LUND: I have just one or two things to add. One is that I approve very thoroughly of what Dr. Sears says, that there is no such thing as an "unresolved pneumonia." I do not mean that one should never use the aspirating tube.

Any man who has had experience in these cases will admit that they are often difficult of diagnosis. I think one may willingly admit that the medical men sometimes make the diagnosis before the surgeon does. I recently had referred to me by two medical men a case of double empyema, showing dullness in both backs. The history and temperature looked like double empyema. I tapped in two places without getting pus, and we fell back upon the diagnosis of "unresolved pneumonia," and did not operate. X-rays which were taken did not help us, and the radiologist, Dr. Ellsworth, also thought they pointed to pneumonia rather than empyema. There was no distinct outline to be seen. After five days' waiting, with a temperature running up and down every night and morning, I tapped again on the left and found an encapsulated empyema between the lung and the chest wall high up. The patient's condition not improving, I tapped again on the next day on the left, and by good luck found another encapsulated empyema where I had never found one before,—between the chest wall and the spine. After the drainage of these, she made a good recovery. I simply quote this case as showing the difficulty of diagnosis.

Dr. Homans has spoken of arbritrating between Dr. Cotton and myself. I do not think Dr. Cotton and I are in great disagreement. I have said I believed in trying everything else before resorting to decortication; valves, blow bottles, etc., should be tried. Almost all my patients get well without decortication, but still I am surprised that Dr. Cotton has never had to do it. I have had to do it only three times since I wrote my paper in 1911, and I don't think that shows I am very eager to do the operation. I never attempt it until all milder methods have failed.

Book Reviews.

Diseases of the Nose and Throat. By A. COOLIDGE, M.D. New York: W. B. Saunders Company. 1915.

This book treats in a fairly comprehensive way the subjects of rhinology and laryngology. As stated by the author in his preface, it is not intended in this small volume to give all the information which the student must occasionally seek in books of reference. At the same time there is a surprisingly large amount of material included in a comparatively small compass.

Certain original features are worthy of special mention: In the chapter on methods of examination, the sections on examination of the trachea by the indirect method and the section on transillumination give valuable points of technic which do not appear in other textbooks. In the next chapter is brought out with emphasis the importance of the clinical history in diagnosis and treatment: a timely warning to overenthusiastic operators who tend to attribute any and all symptoms of nasal disease to the first anatomical irregularity which they observe. The significance of the cardinal symptoms of nasal obstruction and secretion, hoarseness, cough and obstruction to breathing, is discussed. Under the latter heading is considered the significance of different types of respiratory difficulty. The subject of external fractures of the nose is treated in a particularly lucid way in respect of the mechanics of these injuries, the nature of the displacements and the method of reduction.

In the chapter on diseases of the nasal cavities, the important group of so-called vaso-motor disturbances are given their due prominence.

The author's position in reference to the recently much mooted question of the relation of the tonsils to rheumatism, endocarditis and other remote diseases of infectious origin, is a conservative and sane one. He omits any reference to the part which the sinuses or the teeth may play as foci of infection in these diseases.

Special chapters are devoted to bronchoscopy and esophagoscopy and to disease of the mouth and tongue.

Throughout the book the more common operations are briefly but clearly described. There is a definite avoidance of that profusion of illustrations of operations and instruments which is a characteristic of many textbooks, and which betrays either an author's inability to express himself clearly in language without the aid of pictures, or his desire for an impressive display. There is no lack of illustrations when they are really of value to bring out clearly important points in anatomical or pathological descriptions. There is no padding. The language is clear and incisive. The subjects are taken up in an orderly methodical manner and with a due sense of the proper proportions.

There is a characteristic lack of dogmatic assurance in reference to therapeutic measures for many diseases, which may be disappointing to some who would take up the book in the hope of finding a definite line of treatment recommended as the right one in a given disease. But this lack is manifest only in those instances where definite lines of treatment are not of proved value. Recent advances in methods of diagnosis and treatment are not overlooked. On the whole the author has done well what he set out to do and provided an accurate, useful and interesting textbook.

THE BOSTON
Medical and Surgical Journal

An independently owned Journal of Medicine and Surgery, published weekly, under the direction of the Editors and an Advisory Committee, by the BOSTON MEDICAL AND SURGICAL JOURNAL SOCIETY, INC.

THURSDAY, NOVEMBER 25, 1915.

EDITORS.
ROBERT M. GREEN, M.D., *Editor-in-Chief.*
GEORGE G. SMITH, M.D., *Assistant Editor.*
WALTER L. BURRAGE, M.D. } *For the Massachusetts Medical Society.*
FREDERICK T. LORD, M.D. }

COMMITTEE OF CONSULTING EDITORS.
WALTER B. CANNON, M.D. — ALLAN J. MCLAUGHLIN, M.D.
HARVEY CUSHING, M.D. — ROBERT B. OSGOOD, M.D.
DAVID L. EDSALL, M.D. — MILTON J. ROSENAU, M.D.
REID HUNT, M.D. — EDWARD C. STREETER, M.D.
ROGER I. LEE, M.D — E. W. TAYLOR, M.D.

ADVISORY COMMITTEE.
EDWARD C. STREETER, M.D., Boston, *Chairman.*
WALTER P. BOWERS, M.D., Clinton.
HOMER GAGE, M.D., Worcester.
JOEL E. GOLDTHWAIT, M.D., Boston.
LYMAN A. JONES, M.D., North Adams.
ROBERT B. OSGOOD, M.D., Boston.
HUGH WILLIAMS, M.D., Boston.
ALFRED WORCESTER, M.D., Waltham.

ERNEST GREGORY, *Manager.* W. M. LEONARD, *Consulting Manager.*

SUBSCRIPTION TERMS: $5.00 *per year, in advance, postage paid, for the United States.* $6.56 *per year for all foreign countries belonging to the Postal Union.*

The editor will be in the editorial office daily, except Wednesday and Sunday, from one to two-thirty p. m.

Papers for publication, and all other communications for the Editorial Department, should be addressed to the Editor, 126 *Massachusetts Ave., Boston. Notices and other material for the editorial pages must be received not later than noon on the Saturday preceding the date of publication. Orders for reprints must be returned in writing to the printer with the galley proof of papers. The Journal will furnish the first one hundred reprints for half the cost price.*

All letters containing business communications, or referring to the publication, subscription, or advertising department of the Journal, should be addressed to

ERNEST GREGORY, *Manager.*

126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

THE SYNDROME OF PERIODIC ASTHENIA.

IT is well known that many, in fact almost all, of the constitutional psychoses present a certain periodicity as one of their most characteristic traits. This is seen, for example, in periodic psychosis, manic-depressive psychosis, circular inanity, cyclothymia, and psychasthenia. But it is not so well known, or at least generally recognized, that there also exists a clinical entity characterized by period crises of physical fatigue or depression, not accompanied by mental disturbance as a fundamental aspect of the condition, and by no manner of means uncommon clinically. This condition has been properly and instructively described by Déjerine and Gauckler (*La Presse Médicale*, June 17, 1914) under the name of periodic asthenia, which they describe as a typical and characteristic clinical syndrome.

Minor similar crises of fatigue are normal and perhaps even common in most of us; but as a rule the attacks are so slight, and of such brief duration, that they do not attract our attention in a special or pronounced manner. In some individuals, however, the crises of physical weakness or asthenia, without mental disturbance, are so marked that the slightest exertion produces decided fatigue, accompanied in most individuals by a varying, though generally pronounced, loss of sexual desire. The attacks or crises are characterized by their periodicity, their sudden appearance and as sudden disappearance, all with no apparent or ascertainable cause. Some types are very severe, with very marked general physical asthenia and incapacity, at times with changes in the pulse and arterial tension, disorder of the sebaceous glands and hair follicles, disturbed digestion, frequent attacks of migraine, in some cases loss and in others strange increase in weight, while as a rule the appetite and sleep are good.

The condition occurs as frequently in men as in women, more often in early life, in some instances after a severe attack of typhoid fever, influenza or other infectious disease.

The duration of the individual crisis is one to two days on the average, rarely above a week, although major attacks may last as long as two months or so, and in some cases may continue much longer, almost like an attack of melan cholia. The attacks recur two or three times a year or as often as every fortnight. The afflicted individual can find no cause for the condition and so attributes it to the weather or transitory joint changes.

The physician must differentiate this affection from ordinary physiological fatigue, subjective fatigue sometimes occurring in neuropaths, asthenia due to organic disease (as, for example, unrecognized tuberculosis), and asthenia due to definite ductless gland disorder, constitutional neurasthenia so frequent, especially in young persons, inherited or acquired syphilis, and the early stages of general paresis in which attacks of marked asthenia may occur in the initial stage. Not to be forgotten is the appearance of a secondary neurasthenia superimposed upon the original condition here described.

The examining physician, like the patient, can find no particular cause for the condition. But a study of the ductless gland disturbances is of aid

to us here. We know that asthenia may occur in disease of the suprarenal glands, in myxedema and exophthalmic goitre. Pituitary gland has been proved experimentally and therapeutically to stimulate muscle fibres, striated or smooth. Observation seems to show that the glands of internal secretion are so closely interrelated that functional or organic impairment of any one of the chain brings about disturbance in the activity and equilibrium of the others. Furthermore, the periodicity of the functions and disturbances of the ductless glands, especially the thyroid and ovary, is not to be lost sight of. For these reasons, Déjerine and Gauckler are led to believe that the periodic asthenias which they have described are due to a disturbance of the ductless or endocrine gland equilibrium, asthenia alone occurring, or biliary and joint disturbances appearing at the same time.

Therapeutically they declare that the attacks are inhibited or shortened by the administration of thyroid extract (dose 0.10 to 0.15 gm.) with total extract of pituitary gland (dose 0.25 to 0.50 gm.) for three or four days, the dose then being reduced (to 0.05 and 0.02 gm. of thyroid, and 0.10 gm. of pituitary). Complete rest during the period of the crisis, and careful general hygiene in the intervals between the attacks, are indicated.

This syndrome will be at once recognized by every practising physician, for such cases have puzzled us long, and too many of us have permitted ourselves to label the afflicted patient neurasthenic. Whether or not the cause and treatment advocated by Déjerine and Gauckler be found to explain this distressing disorder, the logic certainly is sound, and the authors mentioned have very likely given us the correct solution to this clinical puzzle.

TRACHOMA AMONG NATIVE POPULATION.

SINCE the pointing out by Massachusetts medical men of the prevalence and the dangers of trachoma to the native population through the importation of this disease by immigrants, it was believed the disease was of foreign origin, and that when this source of infection was eradicated the disease would be at an end in these climes. And, indeed, the barring of immigrants suffering from this condition has awakened not only foreign governments to the menace of this disease, and the taking of measures against it, but the number of immigrants with active disease attempting immigration has fallen to a negligible quantity. On the other hand, because of the treatment received by individuals who desired to emigrate, and who would not otherwise have treated themselves or known of the presence or nature of their disease, the number of cured or completely scarred cases is increasing, until it is now almost a rarity to see an active uncured case of trachoma.

Recently, however, investigations carried out by the Public Health Service of a form of ophthalmia found to be very prevalent among the inhabitants of the mountainous countries of West Virginia and Kentucky revealed the fact that this ophthalmia and the resulting high percentage of blindness was trachomatous, and in nature in no wise different from that previously very heavily imported by immigrants. In some districts the prevalence of this disease was almost universal. If for any reason, or because of the mildness of the few cases found among arriving immigrants, the contagiousness of this disease was questioned, it was again forcibly demonstrated here as it had been when the disease was first introduced into Europe by Napoleon's soldiers from Egypt, under the form of "Egyptian ophthalmia." Indeed, some American observers have evinced a decided leaning towards the notion that this disease was of a non-specific and non-contagious character, and that the overgrowth of the lymphatic tissues of the conjunctiva in trachoma, and the absence of trachomatous disease in the very young in whom this lymphatic tissue is not yet developed, proved that the condition was a mere hypertrophy, of the same kind found in adenoid hypertrophy. It is true that thus far all attempts to locate a specific germ or other specific causative factor have proved fruitless, but then that is true of many diseases about whose contagiousness there is no doubt. To various bacteria found in the discharges have been ascribed the causation of this disease, but thus far none of them has fulfilled the Koch postulate necessitating the isolation, the cultivation in pure culture, the reinfection with the bacteria and the recovery of the specific bacterium. The significance of the oft-found negri-like bodies, the so-called "trachoma bodies," has not been determined.

Moreover, in these mountain cases whole families were found infected, and the stage of the disease varied only with the age of the individual—that is, the age of the disease. In one family every stage of the disease could be found. The sanitary conditions and the mode of living fully warranted the spread of this disease among them, especially during the winter, when a whole family would be huddled up in one cabin, using the same towel, the same basin, and even the same water.

The trachoma in this native stock could not be traced to present immigrant importation, and the cause must be found among them or be traced further back. This is likewise true of the American Indians, in whom trachoma is so very common,—that the disease may have been introduced among them years ago by foreign settlers.

The communities where this disease was found so prevalent are now, however, alive to the gravity of the situation and are in the course of establishing clinics and constructing hospitals for treating those afflicted. It is to be hoped that the completion of these facilities and the education of the inhabitants in prophylactic measures will eradicate the disease among them, will be another victory in the conservation of vision, and, above all, will be a victory for preventive medicine.

THE RÔLE OF INTERNAL SECRETION IN MENTAL CONDITIONS.

SINCE the discovery of the significance of the so-called glands of internal secretion—the thyroid, pituitary and adrenal glands—and of the glands of both internal and external secretion—the ovaries and the testicles—there has been an increase in knowledge of their connections with general metabolism as well as with the functions of the mental and nervous systems. In this respect, perhaps the best known and the most studied, as well as the most amenable to influence, has been the thyroid gland. Here the mental symptoms in secretory deprivation have been particularly marked. They range from the absolute cretinoid idiot to the mildly defective. In certain of the so-called goitrous districts there have been a remarkable number of thyroid affections, but particularly the cretenoids and the myxedematous. A poor drinking water has been blamed for this condition, but withal not an unsanitary one, for improvements in this regard have failed to affect the conditions. Certain inorganic salts have been believed to be at the bottom of the trouble, but the latest theory is that the poisonous substances, whatever they are, are derived from old marine bodies. However, boiling the water to 80° C. seems to destroy the substances and prevent the development of the conditions. On the other hand, even filtration through a Berkfield filter will have no effect to prevent the condition.

While nothing so definite either as to cause or as to treatment is known about the other gland disorders or diseases, it is yet quite definitely established that removal of the ovaries or testicles, or as to the latter in congenital eunuchoidism, causes a peculiar mentality, characterized often, as in the myxedematous, by a certain slowness of cerebration, apathy, backwardness, peculiar mental and moral characteristics and the like. This is the accompanying mental condition in acromegaly from pituitary disease and in Addison's disease from disease of the adrenals.

It is suggested that if such gross lesions as are found in the conditions just mentioned produce such marked mental symptoms, there may be minor lesions which produce the minor mental conditions, as exemplified by the feeble-minded or the moron. In these instances, for example, the organic lesion, say in the thyroid, is so slight as to be unrecognized with the present methods of diagnosis. Indeed, there have been reported some very good results in the treatment of feeble-mindedness, as well as insanity, with thyroid extract. In all probability, however, at least in so far as the mental conditions are concerned, not one gland alone is at fault. All the glands act in unison, as does every other organization of the system, and the fault may lie simply in a disturbance of the gland reciprocity or association. There need not be destruction or arrest of growth or development, but it may be a disturbance in blood supply, in nervous control, or in the chemical composition of the secretion. But of whatever nature, disturbance of the secretory function causes a destruction and chromatolysis of the nerve cells, and to the extent of the destruction and of the chromatolysis there may be disturbance or deficiency of mental function.

IMPORTANCE OF EARLY USE OF DIPHTHERIA ANTITOXIN.

THE Boston Health Department desires again to call the attention of the medical profession to the great importance and necessity of the early use of antitoxin in all suspected cases of diphtheria. Many deaths from this disease that have been investigated recently show that physicians have depended on the laboratory findings for the diagnosis of this disease rather than on the clinical evidence that has been presented to them.

Antitoxin has been withheld from many cases for so long a period,—viz: sometimes for four or five days,—that death has intervened without the use of antitoxin. Any case that is suspicious enough to warrant the aid of cultural diagnosis should receive at the same time antitoxin treatment. The Health Department is anxious to cooperate with the medical profession in these cases, and will be glad to visit all suspected cases of diphtheria and to furnish aid in diagnosis and, if necessary, administer the antitoxin treatment. Antitoxin has reduced the great mortality of former years from this disease, but during the past few years the deaths from this disease have increased in this city. Many of the deaths from this disease, after investigation, have demonstrated that children have died in some cases without a physician being called, and in others that the administration of antitoxin has been delayed so long that it has been without avail for the cure of the disease.

A case recently investigated, within the past few days, gives a history of a physician being called, case suspicious, and a culture made. Laboratory reported negative. Culture taken the following day was reported to the physician as suspicious and request made for another culture. On the third day another culture was taken, and before a report could be made the child died. This case is but one of many that have recently come to the attention of the department. Early treatment can reduce the mortality of this disease to almost a minimum, and many lives can be saved. However, to achieve this result the Health Department must have the coöperation of the profession. It is earnestly to be desired and expected that such coöperation shall be manifested, since, with the means for absolute control of diphtheria in our possession, it is the responsibility of practising physicians and of the educated public if that control is not effectively applied.

TUBERCULOSIS DISPENSARIES.

IN the monthly bulletin of the Massachusetts Department of Health for October, 1915, is published the paper on tuberculosis dispensaries, read before the recent New England Tuberculosis Conference at Springfield, by Dr. Eugene R. Kelley, director of the division of communicable diseases in the department. In this paper, Dr. Kelley considers successively the measures available in the struggle against tuberculosis, the place of the tuberculosis dispensary in this work, and the essentials of an efficient tuberculosis dispensary. His consideration is based on the application of the Massachusetts dispensary law, whose enforcement has already shown encouraging results. Since July first of this year the tuberculosis dispensaries of the state report a total of 2778 individuals who have had first examinations. Of this total, 27% are examinations made by dispensaries that were nonexistant before July. Thirty-two per cent. of the cases are reported from the dispensaries in Boston and the remainder by those elsewhere in the state. Notwithstanding these promising figures, the dispensary system has already shown certain shortcomings, chief of which is a failure of adequate grasp upon the tuberculosis problem and its relation to other phases of public health. Another deficiency is the lack of special training and experience on the part of nurses undertaking this work. Dr. Kelley comments finally on the future problems and possibilities of the tuberculosis dispensary system, which, in spite of its defects, he believes an important factor in the control of tuberculosis. There are, at present, 54 cities and towns in Massachusetts which maintain a tuberculosis dispensary service, and these represent approximately 80% of the population of the state. Complete extension of this system to cover the entire Commonwealth, together with the improvements suggested as a result of its early experience, should make the tuberculosis dispensary system a valuable part of the local struggle against tuberculosis in Massachusetts.

MEDICAL NOTES.

SCARCITY OF MEDICAL SUPPLIES IN CHINA.—It is reported from Pekin that the scarcity of medical supplies in China makes it desirable that

there should be established at Shanghai an American firm to supply American hospitals and medical schools in China with the necessary drugs and materials.

"It would seem that the hospitals and medical schools in China experience much difficulty in securing supplies of gauze, cotton of different fibres (sterilizing done in China), suture material, drugs and chemicals in bulk, and surgical instruments. It is recommended that an establishment be opened in Shanghai capable of combining the carrying of stocks of drugs and chemicals with surgical instruments and appliances. There will be a growing demand for these materials in China, especially since the inauguration of the work of the Rockefeller Foundation Commission toward encouraging medical education in this country. The work of this commission will result in securing for certain medical schools and hospitals already in the field a better and more complete equipment and facilities for more extensive work, all of which will involve the creation of a greater market for American drugs, chemicals, surgical instruments and appliances. It is also desirable that the suggested establishment make provision for repairing and nickel-plating surgical instruments, as there is a large and increasing demand for this line of work. The opportunity now presents itself for manufacturers of the United States to see that this general supply house is America."

THE WEEK'S DEATH RATE IN NEW YORK.—According to Registrar Guilfoy of the Department of Health, 66 lives were saved last week, for had the death rate of the corresponding week of last year prevailed during the past week, 66 more persons would have died. The greatest saving of life was recorded under heart disease, 44 fewer persons dying from this cause during the week just closed than during the week ending November 7, 1914. Noteworthy decreases are also to be noted under deaths from pulmonary tuberculosis and other forms of tuberculosis, digestive diseases and diseases of the nervous system. Both lobar and bronchial pneumonia showed a material increase last week over the corresponding week of last year. Five more deaths were reported from typhoid fever than during the corresponding week of 1914. The total deaths for the week were 1220, with the rate of 10.96 per 1000 of population, as compared with 1236 deaths and a rate of 11.55 for the week ending November 7, 1914. The death rate for the first 45 weeks of 1915 is .40 per 1000 of population lower than the corresponding period of 1914, the rates being respectively 13.13 and 13.53.

PREVALENCE OF MALARIA, MENINGITIS, PELLAGRA, POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service of November 5, states that during the month of September, 1915, there were in Mississippi, 32,532 cases of malaria, 1031 of pellagra, 258 of smallpox and 849 of typhoid fever. During the same period there were in New York State 21 cases of cerebro-spinal meningitis, 49 of poliomyelitis and 833 of typhoid. In Kansas there were 58 cases of smallpox and 229 of typhoid. There were 278 cases of typhoid fever in Indiana.

SOUTHERN MEDICAL ASSOCIATION.—The annual meeting of the Southern Medical Association was held at Dallas, Texas, on November 9, 10, and 11. The principal address was delivered by Dr. Rupert Blue, surgeon-general of the United States Public Health Service, on "Sanitary Preparedness." Dr. Blue emphasized particularly the relation of such preparedness to eugenics.

"The first step in the creation of sanitary preparedness is to teach the citizen the value of a sound body. If, upon the plastic mind of the school child the simple truths of sanitation are impressed, we will gradually create a people in which sanitary living is a habit. If by child hygiene we produce better and stronger men and women, these in turn will have learned that mating with the weak and defective produces weak and defective children. Thus we will have a practical eugenic betterment."

Other addresses were given by Dr. W. L. Rodman, president of the American Medical Association, Dr. Isador Dyer of New Orleans, Dr. Lloyd Thompson of Hot Springs, Ark., Dr. P. N. Whitfield of Florence, Miss., Dr. John L. Davis of Waco, Texas, and Dr. J. Ross Snyder of Birmingham, Ala. Dr. Thompson advocated the legal requirement of a Wassermann test prior to the issuance of any marriage license. As a matter of fact it might seem that the requirement of a Schwartz test would be likely to prevent a larger amount of marital disaster and infelicity.

UNIVERSITY OF PITTSBURG.—At the recent dedication of the Elizabeth Steel Magee Hospital in Pittsburg, Pa., the University of Pittsburg conferred the honorary degree of LL.D. on Dr. John W. Williams of Johns Hopkins University, on Dr. Barton Cooke Hirst of the University of Pennsylvania and on Dr. Walter William Chipman of McGill University.

NATIONAL ASSOCIATION FOR THE STUDY OF PELLAGRA.—The third triennial conference of the National Association for the Study of Pellagra was held on October 21 and 22, at Columbia, S. C. At the closing session of the meeting the following officers of the Association were elected for the ensuing year: President, Capt. Joseph F. Siler, M.C., U. S. Army; vice presidents, P. A. Surg. R. M. Grimm, U. S. P. H. S., and Henry W. Rice, Columbia, S. C.; secretary, Dr. James W. Babcock, Columbia, S. C., and treasurer, Dr. James A. Hayne, Columbia, S. C.

UNITED STATES FIRST AID COMMISSION.—In the issue of the JOURNAL for October 28, we commented editorially on the American First Aid Conference held in Washington, D. C., on August 23, and 24, 1915, and on the recommendations and resolutions adopted by that Conference. In accordance with the resolution recommending the appointment of a board on first aid standardization, President Wilson announced on November 9, the appointment of such a commission, whose membership represents seven technical medical and relief organizations. The personnel of this commission is as follows:

Maj. Robert U. Patterson, representing the army and the Red Cross; Surgeon A. M. Fauntleroy, representing the navy; Assistant-Surgeon-General W. C. Rucker; Dr. A. Shelton Horsley of Richmond, Va., representing the American Medical Association; Dr. S. C. Plummer of Chicago, representing the American Association of Railway Surgeons, and Dr. Richard A. Harte of Philadelphia, representing the American Surgical Association. It is believed that the President will later appoint another member so that the army and the Red Cross will each have a representative.

This commission will investigate first aid methods, packages, the standardization of first aid equipment and an identical course of instruction to be followed throughout the country and will report on these subjects to the American First Aid Conference. The president of this conference is Dr. W. C. Gorgas, surgeon-general of the United States Army, and the vice president, Dr. Rupert Blue, surgeon-general of the United States Public Health Service.

LONDON DEATH RATES IN SEPTEMBER.—Statistics recently published show that the total death rate of London for September, 1915, was only 14 per thousand inhabitants living. Among the several districts and burroughs the lowest death rate was 9.4 in Lewisham, a southern suburb, and the highest was 19.9 in Greenwich. This exceptionally high rate in a district which usually has one of the lowest death rates, apparently represents the loss of life from recent Zeppelin air raids.

EUROPEAN WAR NOTES.

CHOLERA IN GERMANY.—During the week ended October 9, 1915, there were in Germany, five cases of Asiatic cholera with one death among the civilian population. A few other cases were reported among prisoners of war.

TRANSFER OF THE WOUNDED ON THE BATTLE-FRONT.—A report from a station for the transfer of wounded somewhere in France states that an average of a thousand wounded men have been sent each week into the interior of France for prolonged care. The station has but a single track for the hospital train but the transfer has been very regular even with a peak load of 1300 patients, 800 of them unable to walk. Every night the beds were full and every noon they were empty. For this station there had been detailed only four physicians and twenty-three aids, but a reserve force was hurried to the spot. At a second centre five consecutive days showed a total of 13,800 wounded, the maximum day being 5520 men.

APPEAL FOR WAR FUNDS.—Report from New York on November 10, states that Mrs. Robert Bacon of that city, chairman of the American committee organized to raise funds for the maintenance of the American Ambulance Hospital at Neuilly, France, has issued an appeal for subscriptions to a fund of $200,000, which will be needed to keep the hospital in operation for another year. The hospital is at present filled to its capacity of 1000 cases and its motor ambulance service is transporting wounded soldiers from the front to various hospitals to the number of about 10,000 each month. The statement issued by Mrs. Bacon descriptive of the work of the hospital and of its needs is in part as follows:

"Since the service was started it has grown because of the demands made upon it, until we have now three hospitals and about 160 cars in the ambulance section. The base hospital at Neuilly, a suburb of Paris, has now about 600 patients, all serious cases, and the advanced hospitals at Juilly which is maintained by Mrs. Harry Payne Whitney, has more than 200 patients. The third hospital is the portable field tent hospital which consists of thirty-three tents and which was purchased from the Department of War of this country. This is stationed at the front and accommodates more than 100.

"The hospital is in great need of money. It costs about $1000 a day to maintain the entire service, and we feel quite confident that Americans who have made this work possible will not allow it to suffer from lack of funds."

A further report from New York on November 13, announced the need of contributions to the American War Relief Clearing House for the care of French wounded soldiers during convalescence.

"There are at present in France 170 depots for éclopés containing at the present moment 150,000 men, and as the cold weather increases the number will become greater. Some of these men are slightly wounded and some ill, but a great majority of them are those whose nerves have been shattered by the trench warfare. They all must be cared for, and need, in addition to absolute necessities, games for both indoor and outdoor diversion.

"For assistance in caring for these éclopés the American Relief Clearing House of Paris has asked for contributions of the following articles: Letter paper and envelopes, lead pencils, needles, buttons, thread, toilet paper, ponchos,

heavy canvas, bed-ticking, sheets, woolen yarn, clothing, blankets, soap in both small and large cakes (should have 6000 pounds per month).

"Contributions of games, such as backgammon, checkers, dominoes, basketballs, footballs, etc., (playing cards cannot be accepted), will do great good in occupying the hands and minds of these sufferers. Cash contributions for emergency relief should be sent to the War Relief Clearing House for France and Her Allies, 15 Broad street, New York city.

"Contributions of material, clothing, bedding, food, games and other supplies should be forwarded prepaid to the warehouse of the War Relief Clearing House, 150 Bank street, New York city, and will be transported from New York to destination in France without expense to contributors."

ST. GEORGE'S FUND.—On November 13, the amount of contributions in Massachusetts to the St. George's fund for the relief of the families of British soldiers and sailors reached a total of $12,085.54. The principal amounts contributed to this fund in other states are as follows:

New York	$6066.32
Pennsylvania	5978.53
Connecticut	4289.00
Pacific Coast	4075.68
New Jersey	4062.26
Illinois	3139.89
Michigan	1933.50
Ohio	1467.77
Rhode Island	1272.35

The grand total of the entire fund now amounts to $47,328.75.

WAR RELIEF FUNDS.—On Nov. 20 the total of the principal New England relief funds for the European War reached the following amounts:

Jewish Fund	$199,000.00
American Ambulance	69,296.00
Polish Fund	55,446.11
Allied Fund	33,881.30
French Fund	24,048.79
German Fund	16,500.00
LaFayette Fund	12,087.99
Italian Fund	11,835.69
Armenian Fund	10,847.00
Surgical Dressings	9,036.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending November 20 there were 203 deaths reported, with a rate of 14.54 per 1000 of population, as compared with 204 and a rate of 14.78 for the corresponding week of last year.

Deaths from pulmonary tuberculosis numbered 16 for the week. An analysis of a group of recent deaths from tuberculosis gave 18 months as the average duration of illness, though the average length of life after they were reported to the Health Department was only 2 months. This is certainly an indication that some cases are not reported as soon as the diagnosis is made.

There were 40 deaths under 1 year as compared with 35 last year, and 63 deaths over 60 years, against 51 last year.

Total deaths reported in 46 weeks from January 2 to November 20 were 10,411 against 10,423 for the corresponding period last year. Deaths under one year reported in the same period were 1782 against 1775 for the corresponding period last year.

HOSPITAL BEQUEST.—The will of the late Mary T. Gorham of Boston, who died on Oct. 29, contains a bequest of $2000 to the Cottage Hospital at Exeter, N. H.

BOYLSTON MEDICAL PRIZES.—These prizes, which are open to public competition, are offered for the best dissertation on questions in medical science proposed by the Boylston Medical Committee. They were established in 1804 and are of considerable interest in Harvard University.

At the annual meeting held in Boston in 1913, no prize was awarded.

For 1915, there is offered a prize of three hundred dollars and the Boylston Prize Medal, for the best dissertation on the results of original research in medicine, the subject to be chosen by the writer. Dissertations entered for this prize must be in the hands of the secretary, H. C. Ernst, M.D., Harvard Medical School, Boston, Mass., on or before December 31, 1915.

In awarding these prizes, preference will be given to dissertations which exhibit original work, but if no dissertation is considered worthy of a prize, the award may be withheld. Each dissertation must bear, in place of the author's name, some sentence or device, and must be accompanied by a sealed packet, bearing the same sentence or device, and containing within the author's name and residence. Any clew by which the authorship of a dissertation is made known to the Committee will debar such dissertation from competition. Dissertation must be printed or typewritten, and their pages must be bound in book form. All unsuccessful dissertations are deposited with the secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

By order adopted in 1826, the secretary was directed to publish annually the following votes:

1. That the Board does not consider itself as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.

2. That, in case of publication of a successful dissertation, the author be considered as

bound to print the above vote in connection therewith.

The Boylston Medical Committee is appointed by the President and Fellows of Harvard College, and consists of the following physicians: William F. Whitney, M.D., chairman; H. C. Ernst, M.D., secretary; Theobald Smith, M.D.; William T. Porter, M.D.; Henry A. Christian, M.D.; Edward H. Nichols, M.D.; John Warren, M.D.

The address of the secretary of the Boylston Medical Committee is Harold C. Ernst, M.D., Harvard Medical School, Boston, Mass.

BOSTON ASSOCIATION FOR THE RELIEF AND CONTROL OF TUBERCULOSIS.—The annual meeting of this Association will be held at the Twentieth Century Club, Monday, November 29, at 4 p.m. Following the annual reports of the treasurer and secretary, there will be an address by Miss Ella Phillips Crandall, executive secretary, National Public Health Nurses' Association, New York City, whose subject will be "The Tuberculosis Nurse as a Modern Health Agent." She will be followed by Miss Eunice H. Dyke, superintendent of Public Health Nurses, Toronto, Canada. This meeting will be open to the public and should be of interest to physicians and nurses, as well as to tuberculosis workers.

PERSONNEL OF THIRD HARVARD SURGICAL UNIT.—In addition to the members of the third Harvard Surgical Unit, whose names were published in last week's issue of the JOURNAL, the personnel of this unit will contain Dr. William R. Porter of Boston and Dr. C. Franklin MacDonald, a young practising dentist of Brooklyn, N. Y.

APPOINTMENT OF BOSTON SCHOOL PHYSICIANS.—At the meeting of the Boston school committee on November 15, the following board of forty-one school physicians was appointed to replace the former board of eighty members. These appointees will begin their service on November 22 and each will receive an annual salary of $504, with the exception of one, detailed to the school employment bureau, who will receive $900. This board will be under the direction of Dr. William H. Devine, who will also have charge of the school nurses. The following is a list of the appointees, who will constitute the personnel of the new board of Boston school physicians:

Dr. Francis G. Barnum, Dr. Joseph A. Cogan, Dr. Simon F. Curran, Dr. Carlisle Reed, Dr. Charles E. Shay, Dr. Frederick W. Stetson, Dr. Edward F. Timmins, Dr. James A. Reilly, Dr. Edward J. O'Brien, Dr. Martin J. English, Dr. Russell F. Sheldon, Dr. William F. Temple, Jr., Dr. Roland W. Brayton, Dr. Joseph B. Lyons, Dr. Bernard W. Pond, Dr. Theodore C. Erb, Dr. George E. Winslow, Dr. David E. Hanlon, Dr. Charles F. Stack, Dr. Irving Sobotky, Dr. John H. Moore, Dr. Phillip E. A. Sheridan, Dr. Solomon H. Rubin, Dr. Ernest L. Booth, Dr. Harry Olin, Dr. Morris Frank, Dr. Bradford Kent, Dr. James E. Blake, Dr. Edward A. Tracy, Dr. Arnold N. Allen, Dr. Mitchell Sisson, Dr. Joseph H. H. Kelley, Dr. David P. Hayes, Dr. Harry Fein, Dr. William H. Robinson, Dr. Mary T. V. Moore, Dr. Joseph E. Hallisey, Dr. William J. Brown, Dr. Francis J. Doherty, Dr. F. P. Silva, Dr. John T. Sullivan.

Obituary.

GEORGE MILLER STERNBERG, M.D.

DR. GEORGE MILLER STERNBERG, U.S.A., a retired surgeon-general of the army, distinguished both in medical and in military circles, died at his home in Washington, D.C., on November 3, 1915. Dr. Sternberg was born on June 8, 1838, in Oswego County, N. Y., and after obtaining his preparatory education at the Hartwick Seminary, he taught school for three years at Germantown, N. J. In 1857 he began the study of medicine in a physician's office and subsequently attended the College of Physicians and Surgeons in New York, from which he received the degree of M.D. in 1860.

At the outbreak of the Civil War, Dr. Sternberg took the examination for the army medical corps. On May 28, 1861, he was appointed assistant surgeon and was assigned to duty with the third regiment of United States Infantry. He served with this command throughout the war and was successively promoted to be captain and major for faithful and meritorious conduct. At the close of the war he continued in the army medical service and on July 12, 1867, was made lieutenant-colonel for gallant service in the performance of his professional duty in action against the Indians at Clear Water, Idaho. During the next three years he served in various Indian campaigns. In 1871 he was in charge at Fort Columbus in New York Harbor during the yellow fever epidemic of that year and in 1873 and 1875 served in Florida in a similar capacity. During the Spanish War Dr. Sternberg, as surgeon-general of the United States Army, established military hospitals at Key West, and at Fort Thomas, Fort MacPherson, Fort Myer and at San Francisco, and upon his recommendation, two hospital ships were purchased and equipped. The establishment of the Army Medical School at Washington stands also to his credit and is, perhaps, the best known and most important of the services associated with his name. Dr. Sternberg was surgeon-general from 1892 to 1902, and upon his retirement in the latter year was given the rank of brigadier-general.

Miscellany.

HEALTH OF THE UNITED STATES NAVY.

THE annual report of the Surgeon-General of the United States Navy, Dr. Braisted, issued in Washington on November 6, emphasizes on the one hand the increase of tuberculosis and other pulmonary diseases among sailors and, on the other hand, the notable decrease in the incidence of typhoid fever. During the year under consideration, there were in the United States Navy 38 deaths from tuberculosis and 33 from pneumonia. The reason for this exceptional incidence of pulmonary disease is attributed "to the crowded condition necessary to manning and equipping vessels of war, in which hygienic primal principles, such as are accepted as indispensable in life on shore, practically never achieve recognition.

"Overcrowding, extreme reduction of the amount of air space per person, improper proportion of moisture and the inappropriate placing of air inlets and exits, over- or under-heating of the air,—these are all faults and problems incident to the packing of 1000 men in quarters which theoretically should hold but 300."

With typhoid fever, however, the situation is the reverse, since the adoption of compulsory anti-typhoid inoculation. Three years ago there were in the Navy, 222 cases of typhoid fever with fifteen deaths; last year there were only 15 cases and no deaths. Dr. Braisted believes that this practical elimination of typhoid fever from the navy is due almost entirely to prophylactic inoculation.

"While the reduction in morbidity has been coincident with a marked improvement along the same lines in the civil population of the larger cities of the United States, which cannot be ascribed to immunizing methods, the improvement in our service has far outpaced that ashore. Undoubtedly the country-wide education regarding sanitary principles, as disposal of waste, improvement of water supply, more extensive pasteurization of milk, anti-fly campaigns, etc., have been most potent in producing the results, shown in tables, taken from the *Journal of the American Medical Association*.

"Reports from the armies of the contending nations now in the field show remarkable improvement. The Germans, who had provided extensive hospital accommodations for expected or possible incidence of typhoid, measured by standards of previous conflicts, have been able to convert these facilities to other uses owing to the comparatively slight incidence of what was once the worst scourge of a military campaign. In the British Expeditionary Force in France during the first ten months of the war the ratio of morbidity was 14 times, and of mortality forty-two times greater among the uninoculated than among the inoculated. (*British Medical Journal.*) The sanitary condition of the French Army is particularly satisfactory. No epidemics have appeared, thanks to the knowledge and strict application of the fixed laws of hygiene. If a few isolated cases of typhoid fever appear, it is because those who are attacked have not been protected by vaccination, or have been vaccinated in an unsatisfactory manner as to quantity or method of application. In the early months of the war, moreover, since preventive vaccination had not yet been made general, and numerous cases were presenting themselves in the infectious hospitals, it was thought that cases of typhoid fever had been found in those who had been vaccinated. This was not so. These cases have been found to be paratyphoid. (*Lancet*, London, Aug. 7, 1915.)"

In conclusion the report recommends the provision of two new hospital ships in addition to the *Solace*, the only hospital ship now in the Navy. It further recommends that arrangements be made for the purchase of additional merchant craft for use as ambulance ships or medical transports in time of war.

MILITARY MEDICINE IN THE SEVENTEENTH CENTURY.

IN the issue of the *Lancet* for October 16, 1915, appears an editorial comment on two seventeenth century books of military medicine and surgery which have recently been acquired by the library of the Royal Society of Medicine. Both these works were printed in London by William Goddid and were "sold by one Moses Pitt at the Angel over against the little north door of St. Paul's Church." The first book is entitled "Cista Militaris or a Military Chest," being a description of "Dr. Lower's lancet for the more safe bleeding with an illustration thereof"

"The chest was based on the 'Military Chest of the most Illustrious Heroe, Maurice, Prince of Orange, wherein not onely Medicines and Instruments, but also Linnen, Rowlers, and other Necessaries were prepared.' Of the medicines, a supply was to be kept of Purging Simples, Purging Compounds, Electuaries and Powders Strengthening the Heart and noble parts, Aromaticks, Distill'd Waters and the like, Syrup, Roots, Herbs, Flowers, Seeds, Fruits, Oyl, Unguents, Fats, Plaisters, Gums, Minerals and Meals. The Chirurgeon is also to be furnished with necessary Instruments some to be fitted for a Box to carry about him in his Pocket; these ought to be made small and little, that they may neither load him, nor afright the Patient. Among these figure Trepans, Levatories, Scalpra's, Instruments to draw forth Bullets from Gunshot Wounds, and a great Saw for amputating Great Members. We learn further that a Chirurgeon

ought to be provided with splints of several bignesses, made of thin pieces of wood. Finally, Lint to keep the lips of the Wounds asunder, that they unite not again. And to conclude: Candid Reader, be sure that it be so provided with mendicaments and Instruments, that out of it, when occasion requires, thou mayst be able to assist and relieve the Sick; for what thou art employed about here, is neither Beast, nor Pretious Stones, but Man for whom the Son of God shed his pretious blood upon the Cross.

"The second book is entitled 'A Body of Military Medicines Experimented by Raymundus Mindererus, late Chief Physitian of the Electoral Court of Bavaria, and Englished out of High Dutch.' It begins with the Morals of a Souldier, who ought to serve his Prince faithfully to the best of his skill and power, to obey his Officers readily, and to do to all others, as he would be done to, if he were in their condition. Then is given advice regarding the care of his Body as follows:—To free thyself from Vermin, take a good quantity of Wormwood, and the inner cuttings of horse-hoofs; boyl these both together in half lye and half water, and so put thy shirt into it, and afterwards dry it in the Air, without washing it out any other way, and not a lowse will come into it. If thou canst not have Spring water, let some drops of Oyl of Vitriol fall into it, and you need not then fear any corruption or poyson in such water. Otherwise if time will permit, let it boil up and cool again, and you may drink of it safely. Concerning the Army Medical Staff we learn:—These ought to be no Youngsters, that are lately come from Schools and Universities, but such as are expert in the Cure of Diseases. The Physitians and Chirurgions are to be intimate friends together, assisting one another without envy and pride, for the better relief of their Patients. 'Tis very necessary, both these should go abroad and travel before they undertake to practise, thereby to learn to converse with the more discretion and gentleness with all sorts of humors. In therapeutics the work is both informing and dogmatic:—To avoid fevers, keep thy body clean every way; be chearful; never fasting, nor never full. To heal injuries, keep the wound clean, and let not many look into it, for fear they should by their breath annoy it. You may also recover frozen Feet with white rotten Turnips, beaten with Butter or Tallow, and so clapt on. If you have a strong breath, take now and then three or four Aloes-pills."

SEIZURE OF SUBSTITUTE SPECIFICS.

THE United States Department of Agriculture has recently issued the following statement relative to its seizure of certain cheap imitations of well-known preparations which have recently been put on the market during the shortage of certain drugs on account of the European War. Reference to these fraudulent drug substitutes was made in a recent issue of the JOURNAL.

"Several shipments of worthless imitation drug products have been seized by the officials in charge of the enforcement of the Food and Drugs Act. Itinerant peddlers are selling to drug stores large quantities of preparations made up and labeled in imitation of high-priced patent medicines of foreign origin. Only small quantities of the genuine medicines have been imported since the war began, causing a great increase in prices. Unscrupulous manufacturers are attempting to reap a harvest by substituting for the genuine medicines cheap chemicals with no medicinal value whatever. In order to make it difficult to trace these preparations to the parties responsible for their manufacture, they are not usually distributed through the regular channels of commerce, but are peddled about to drug stores by itinerants, who make immediate delivery at the time of sale.

"A preparation put up in imitation of "Neosalvarsan," a medicine which has largely displaced the preparation known as 606 in the treatment of syphilis, is being distributed to drug stores in this manner. A sample labeled "Neosalvarsan," which was recently examined by the Department, was found to be nothing more than salt colored with a coal tar dye, none of the genuine neosalvarsan whatever being present. The label on this product was an exact reproduction of the genuine imported neosalvarsan, or it was an original container refilled with the imitation article.

"This fraud is held to be particularly flagrant, according to the medical experts of the Department, not alone because a worthless preparation is sold for a high price, but mainly because neosalvarsan is usually administered by injection directly into the blood of the syphilitic patient. The cheap substitute is not only worthless in the treatment of this disease, but when injected directly into the blood might work considerable injury.

"Other preparations which are peddled to druggists and purport to be acetylsalicylic acid, commonly known as aspirin, a medicine of foreign origin regularly prescribed by many physicians for certain ailments, have been seized by the officials in charge of the enforcement of the Foods and Drugs Act, because an analysis showed that the products were worthless imitations.

"Owing to the manner in which these preparations are peddled about, it is difficult to trace the interstate shipment of any of them, and in cases where there has been no interstate shipment the Federal Food and Drugs Act has no jurisdiction. On information furnished by the Federal authorities some of these imitation goods have been seized by city officials who had authority under state laws to proceed when there had been no interstate shipment."

Correspondence.

MEDICAL EXPERIENCES OF A RHODES' SCHOLAR IN THE EUROPEAN WAR.

(From Our Special Correspondent.)

DEPARTMENT OF PATHOLOGY,
UNIVERSITY OF OXFORD, Oct. 26, 1915.

Mr. Editor: During the course of this war, I have had opportunities of seeing and of working in some of the war hospitals in England, France and Serbia, as well as in Germany. In Serbia where I worked during the typhus epidemic, hospitals consisted of schools, barracks, factories or any buildings that happened to be larger than the ordinary small Serbian mud cottages. The equipment was most primitive. Beds were simple sacks of straw upon the floor. If the hospital was not overcrowded each patient had a sack to himself, but during the height of the epidemic two of these rude mattresses had to be placed together, to be shared by three men. The bed clothing in a good hospital consisted merely of a blanket, but in ordinary places a patient was compelled to keep warm as best he could, with the remnants of his uniform and overcoat. Food, consisting of soup and bread, was usually sent to the different hospitals in each town, from one central kitchen, and at meal times you would see pairs of Austrian orderlies, for the prisoners did all of the rough work, marching through the market place with a huge caldron of soup suspended from a pole on their shoulders. For medical treatment they were reduced to more or less futile attempts at cleanliness and fresh air, the former being difficult because of the vermin, and the latter was opposed by the Serbs on general principles. In fact the only way windows could be kept open while one's back was turned, was to break the glass. As a rule, drugs were reduced to aspirin to treat the headaches which are so terrific in typhus. Very little beyond this could be done because of the lack of supplies. The routine on admitting a patient was to remove his clothing to be sterilized if possible, to give him a bath, to clip his hair and if any ether was available, to scrub his head with it, for if this precaution was not taken, your patient would be literally alive with lice again within a few days, for the eggs remaining in the roots of his hair would have hatched.

The real need of Serbia during the epidemic, however, was not hospitals to care for the victims, after typhus had already set in, but sanitary organization to prevent and limit the spread of the disease. The overcrowding of the center of the country by refugees from the northern districts, invaded by the Austrians, had produced such filth and bad living conditions that the typhus had every opportunity to increase and flourish. This sanitary organization has now been ably accomplished by the American Red Cross Sanitary Commission in spite of the great difficulties caused by the ignorance of the general population. But now that Serbia is suffering from a second invasion that is many times worse than the early one, and the population is fleeing in hordes toward the Montenegrin frontier and overcrowding the villages in that region, it is difficult to imagine what will prevent a repetition of last winter's scourge.

From Serbia I went to Italy with Sir Thomas Lipton, who was using his yacht *Erin* for Red Cross transportation, and from Italy I reached England by crossing Austria, Germany and Holland. Although the towns in Austria which I visited were filled with wounded, yet it was not until I reached Germany that I had opportunities of going through war hospitals. The first one that I visited was the German-American hospital in Munich. The contrast of their equipment and efficiency with the poverty and incompleteness of Serbian hospitals was amazing to say the least. Everything was completely organized and systematized. When the head surgeon made his rounds every man who could move, even an unfortunate man with one leg, came to attention at the foot of his bed. This strict discipline in the hospitals was very noticeable, and the fact that cures seemed to require less time there, than in English or French hospitals where patients are allowed more freedom, might justify it. The war has reduced the medical supplies of Germany to such an extent that cloth bandages and dressings, and all preparations requiring glycerine were rigorously conserved. The Germans carry their dislike of England and the English language so far, that I saw an American nurse severely reprimanded by her chief, for writing notes on her medical chart in English instead of in German. But the thing that impressed me most was that the German authorities were not merely content with curing their patients as quickly as possible, but that in addition they laid great stress on putting a patient into such condition, that when discharged, even though unfit for military service, yet he could still be self-supporting and not be a burden upon the state. "There must be no unnecessary cripples at the end of the war" was the text of the official order from Berlin. Therefore, every bone wound had to be treated by an orthopedic surgeon. Of course, this involved tremendous work on the part of the whole medical service, but the splendid results which I saw at the Orthopedische Klinik certainly vindicated the extra labor, for Germany will have a smaller proportion of cripples than the other nations after this struggle is finished. After a man is passed as medically fit for military service again, he is granted a furlough before he is sent back to the trenches and, I believe, that the Germans are less reluctant to go back than the men of the Allies, although this may be explained by the feeling of obedience to discipline that is well drilled into a German soldier.

In France, where I worked for two months before the Serbian epidemic, the hospitals were all well equipped, and with the exception of the first few months when the wounded transportation system had still to be properly organized, the medical service was most efficient. At the American Ambulance at Neuilly, for instance, motor cars were kept constantly at La Chapelle where the Red Cross trains arrived. Patients were quickly brought to the hospital and inspected at once by the medical officer of the day. The patient is then undressed, all of his clothing and kit are sent to the sterilizing department and the man is given a thorough bath before being carried to the ward. Practically all of the men are given anti-tetanic serum at the first dressing station and the letter A is then chalked on the left leg, but if the stress has been too great, as during the engagement at Soissons, this injection must be omitted until later, so that one of the first duties of the receiving medical officer is to look for this chalk mark. If it has not been made, or in many cases, if it has been rubbed off during the transportation from the front, anti-tetanic serum is immediately administered. Consequently tetanus is practically wiped out. Although at present the hospital discipline has become more rigorous, yet the French *piou-pioux* is much happier and more contented to remain wounded than the German Fritz.

In the English hospitals not only those conducted by the Royal Army Medical Corps but also in the American Women's War Hospital at Paignton, and in the Canadian Red Cross Hospital at Clevedon, one finds that the German efficiency is combined with a more human interest in the patient and his happiness. Tommy may not be put back into action quite as quickly as a German soldier but he certainly has much more comfort and pleasure during his stay in a base hospital. The medical transportation department has been splendid. Men from France are quickly passed through dressing stations and if the wounds are not too serious, they are sent home to England. From the Dardanelles small boats transport the wounded from the dressing stations on the shore of

Suvla Bay on Cape Hellas to hospital ships lying off shore, and if they happen to return by the *Acquitania*, they reach a base hospital in England within six days, while even the slowest ships always make the voyage in ten days. This sea trip has a very beneficial effect on the patients and very many of them are practically convalescent when they reach England.

A very large proportion of the cases from the Dardanelles have been medical—dysentery, both amebic and bacillary, paratyphoids, and a few rare cases of typhoid, although the "typhoid" inoculation has practically stamped out the last named disease.

In the care of wounds England has made tremendous contributions to science. For instance, I have seen what appeared to be hopelessly infected shrapnel and bullet wounds quickly cleaned up, and the patients' temperatures brought back to normal by immobilization and constant surface drip irrigations with hypertonic salt solutions. The treatment of fractures has also been greatly improved, and since the exhibition of new splint shield in London last week many new ideas have been put into practice. One patient in our base hospital here in Oxford with a compound fracture of the femur who required two orderlies to move him into a position so that his wounds could be dressed can now, with the aid of a new splint which suspends his leg on a movable trolley overhead, move himself about on his bed with perfect ease and no pain.

Very truly yours,

WILBURT C. DAVISON.

EXAMINATION OF NOSE IN EYE DISEASES.

HOTEL HARVARD, 640 HUNTINGTON AVE.
ROXBURY, MASSACHUSETTS.

Mr. Editor: When I was treating eyes at the Boston Dispenary, my friend Dr. E. D. Spear called my attention to the fact that many diseases of the eye,—conjunctivitis, blepharitis, episcleritis,—are dependent upon diseases of the nose. It is certain that they will not get well unless the nose is treated. Of course no competent oculist would operate for cataract unless he had made the tear passage sterile. I urge upon all eye surgeons to examine the nose in every eye case of an inflammatory nature, or to have it done.

Your obedient servant,

EDWARD L. PARKS, M.D.

SOCIETY NOTICES.

NEW ENGLAND PEDIATRIC SOCIETY.—The thirty-ninth meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, Dec. 10, 1915, at 8.15 P.M.

I. Report of Council and nomination of officers.
II. Report of Treasurer.
III. The following papers will be read:

1. Simple Incision in the Treatment of Pyloric Stenosis, by James S. Stone, M.D., Boston.

2. Spasmophilia: Report of Ten Cases,—Etiology and Treatment, by Fred P. Webster, M.D., Portland, Me.

3. Fermentative Diarrhea in Infants, by Lewis W. Hill, M.D., Boston.

IV. Election of officers.

Light refreshments will be served after the meeting.

F. M. BUCKINGHAM, M.D., *President.*
RICHARD M. SMITH, M.D., *Secretary.*

THE NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at Masonic Temple, 171 Warren Street, Roxbury, Tuesday, Nov. 30, at 8 P.M., sharp. Business, communication on chronic nephritis by David L. Edsall, M.D., and discussion by David N. Blakely, M.D., M. J. Cronin, M.D., Edward N. Libby, M.D. Refreshments after the meeting. Telephone Roxbury 22753.

BRADFORD KENT, M.D., *Secretary,*
798 Blue Hill Ave., Dorchester.

THE HARVEY SOCIETY.—The third lecture of the series will be given at the New York Academy of Medicine, 17 West 43d Street, on Saturday evening, Nov. 27, 1915 at 8.30 P.M., by Dr. Eugene F. Du Bois, Cornell University. Subject: "The Respiration Calorimeter in Clinical Medicine."

RECENT DEATHS.

DR. HORACE CHASE, a Fellow of the Massachusetts Medical Society since 1867, died at Dorchester (Boston), Mass., January 11, 1915, aged 83 years.

DR. CHARLES A. CHURCH, who died recently at Passaic, N. J., was born at Norwich, N. Y., in 1840. After receiving his preparatory education at Norwich Academy, he attended the Hahnemann Medical College of Philadelphia, and the New York Homeopathic Medical College. He was a member of the staff of the Passaic General Hospital and of St. Mary's Hospital at Passaic. He was formerly president of the New Jersey State Homeopathic Medical Society and of the New Jersey Medical Club. He is survived by his widow and one son, also a physician.

DR. WAYNE SMITH, who died of cerebral hemorrhage at Detroit, Mich., on November 12, was born in 1876. He was formerly for several years superintendent of the St. Louis City Hospital, and was known as an expert on hospital administration, concerning which he had published several works. He came to Detroit in 1913 as superintendent of the Harper Hospital in that city, a position which he held at the time of his death.

DR. EDWARD LIVINGSTONE TRUDEAU, who died on November 15 at Saranac Lake, N. Y., was born in 1848. He received the degree of M.D. from the New York College of Physicians and Surgeons in 1871 and, at first, began the practice of his profession in New York City. In 1884, however, he established a sanitarium for the treatment of tuberculosis at Saranac Lake; and from his work at that institution became noted throughout the country as an expert in the knowledge and treatment of the disease.

DR. ALBERT VEEDER, who died on November 16, at Lyons, N. Y., was born at Ashtabula, Ohio, on November 10, 1848. After graduating from Union College, New York, he received the degree of M.D. from the University of Buffalo, and after teaching for a time, engaged actively in the practice of his profession at Antwerp, N. Y. He had been interested, also, in experimental work on the transmission of typhoid, the open-air treatment of pulmonary tuberculosis, the problems of public water supply, garbage disposal and other aspects of sanitation.

DR. JOHN C. WEBSTER, who died on November 15 in Chicago, was born at Hopkinton, Mass., in 1843. He received the degree of A.B. from Dartmouth College in 1864 and that of M.D. in 1867 from the Harvard Medical School. He immediately settled in the practice of his profession at Chicago, in which he remained actively engaged until his retirement in 1908. He is survived by his widow and by four children.

APPOINTMENT.

WASHINGTON UNIVERSITY MEDICAL SCHOOL—*Dr. Leo Loeb* has been appointed professor of comparative pathology.